AMERICAN RAILROAD JOURNAL,

AND

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AMERICAN RAILROAD JOURNAL.

PUBLISHED AT 105 CHESTNUT ST. PHILADELPHIA.

Saturday, September 9, 1848.

RAILROAD IRON—SHEET IRON—BRASIER'S RODS—HOOPS—SCROLL—BANK'S BEST—& OTHER GOOD MAKES OF ENGLISH IRON.

100 Tons Railroad Iron—Staffordshire make—56 pounds per yard—shipped from Liverpool 20th July, expected to land on wharf from 10th to 20th September.

Also have Invoices of Sheet Iron, Brasier's Rods, Hoops, Scroll, and Band Iron, Banks best, and other good makes of English Rolled Iron, to arrive, suitable for Railroad Axles, etc., etc., equal in quality to American Rolled Iron. I have agency of several best makers in England and Wales, and can import for Railroad Companies, and others, on best terms, and at much less prices than they can be supplied from American Mills.

DAVID W. WETMORE,
218 Water street.

New York, Sept. 9, 1848. 6w*

Improved Locomotive Boiler for Burning Anthracite Coal.

Many experiments have been made, and much money expended in the construction of *boilers* for locomotives, in which anthracite coal may be used to advantage; and in several instances important results have been attained, but in the most successful that we have seen, or heard of, there has been a serious difficulty, in the destruction of the tubes and fire box, by the intense heat of the anthracite fire. There has been a lack of space, or of grate surface, over which to spread the fire, a difficulty not easily overcome in the oadinary form and size of locomotive boilers, but which is, we think, successfully overcome in the plan of Mr. Septimus Norris, which we lay before our readers this day, and to which we call their attention.

Atlantic and St. Lawrence Railroad.

We learn, says the Portland Advertiser, of 5th inst., that this company has transported 6,257 passengers over this road since it was opened for the regular running of the cars, July 20, to August 21—making an average of 174 per day.

There has been a regular increase in its business every week, and the present week it has averaged over 200 passengers per day.

The company has not, until now, been able to transport much freight, bnt it is calculated that this part of its business will increase the receipts of the road considerably.

Since about the 1st of August, the track layers have laid the timber and iron as far as Dunn's corner, four miles from North Yarmouth depot, and the engine, with a train of timber and iron, ran as far as this point, Friday morning. As soon as the ballasting is completed, the cars will be run to that point, and they will probably run as far as New Gloucester about the middle of October, and soon after in connection with the Androscoggin and Kennebec road to Lewiston falls.

The new broad gauge engine, the "Montreal," built by the Portland company, will be put on the road by the middle of September, when a third passenger train will be run each day on the road.

Camden and Amboy Railroad Co.
Its Practices and its Professions.

We alluded, in our last number, to the statement, in the address of the directors of this company, to the people of New Jersey—which we published in No. 32, for August 5th—in which they give the *comparative rates* of transportation on *their* works, and on 117 other railroads and branches in the U. States. We characterised that statement as "neither just nor dignified," and we feel bound, in using such terms towards gentlemen occupying the position in society conceded to the managers of this road, to show wherein their comparison is "unjust" towards *other* railroads—and "undignified," because untrue, when the comparison it is when the *rates* charged on the *Camden and Amboy railroad* are fairly compared with the rates charged on the other railroads in the United States.

It is unjust, in the first place, to compare the rates charged on *short* lines, and *branch* roads—which are usually made to accommodate comparatively small towns, or sparsely populated districts—with lines of 80 to 100 miles in length, connecting large commercial cities; and it is also unjust to compare the rates of fare and freight of a road of 90 miles in length, between the two largest cities in the Union, with the rates on railroads at the south, where they pass through regions of country cultivated mainly by slaves, who never travel—and where the items of freight, in one direction, are confined to a very small number of articles; but it is *more especially unjust* for these managers to attempt to make out a case, in their favor, by adding the amount of transportation for the month of May, 1848, on the *canal*—which is reported as follows, viz:

Coal	67,478
Grain and feed, 27,250 bushels	615
Lime, 44,229 bushels	1,490
Salt, 1,550 bushels	52
Timber and lumber, 1,525,957 feet	3,178
Pig and railroad iron	1,675
Flour and corn meal, 4,833 bbls	440
Whiskey, 531 bbls	66
Fish, 97 bbls	14
Nails, 1,805 kegs	90
Hay and straw	368
Ice	603
Stone	668
Sand	365
Clay	375
Brick, 72,770	145
Merchandise	6,666

or 84,488 tons carried 110 miles—to that on the railroad for the same period, which is reported at 1,983 tons carried 90 miles, making 86,470 tons, or equal to 9,473,150 tons carried *one mile*—for $122,099—*or at an average freight on both works of one cent and twenty-nine hundredths of a cent per mile.*"

This is certainly straining a point to make out a favorable case before the people of New Jersey—the tribunal before which the company is likely to be arraigned; and it fully sustains us in our remark, that "it is not just," when the facts of the case are fully understood, and the rates of freight, on *their railroad*, during the year 1847, are compared *fairly* with the rates of freight charged on other railroads during the same period. If they had taken the rates of freight, for the "Camden and Amboy Railroad and Union Transportation Line," from the same

source that they took the rates for the "117 railroads and branches,"—viz: Doggett't Railroad Guide for 1848—they would have shown that the charges are, by that company, for "teas $10 per ton, drygoods 40 cents, light merchandise 50 cents, and bulky merchandise 75 cents per 100 lbs."—or an average of 55 cents per 100 lbs—which is equal to $11 per ton of 2000 pounds—*or* 12·23 *cents per ton per mile*, instead of 1·29 cents per ton per mile, as represented in their address to the people of New Jersey; and we see no reason why "Doggett's Railroad Guide" is not as good authority in relation to the "Camden and Amboy Railroad and Union Transportation Company," between New York and Philadelphia, as in relation to the "117 other railroads and branches" in twenty different States. They may not discredit it their own witness—by whom they attempt to fix the brand of *comparative extortion* upon the whole railroad management of the Union, while they make themselves out as serving the public for *less than* a remuneratiag compensation. It reminds us of the common practice of the rogue, who—being detected in his villany, rushes into the street, amidst the crowd, followed by those who caught him in the act, crying "stop thief," cries "stop thief" louder than his pursuers, thinking thus to divert from himself, and towards other and innocent parties, the attention of the people around, who are thus oftentimes deceived, and made instruments in aid of fraud and villany; but it will not do in this case, because there are too many thousands who have *written* evidence of the unfairness of this attempt at deception—or, to use a milder term, this apparent effort to show that they are serving the people at *exceedingly low and patriotic rates*.

We cannot devote more space to this matter in this number, except to give their comparative statement of the *rates charged* in the different States for 1st and 2d class freights, for the purpose of requesting our readers in the different States, and on each *railroad*, to give us the rates as they *were* in 1847, and as they *are* in 1848, that we may be able to give the facts, and correct our errors, if we have committed errors, on this subject. We seek to obtain and give the truth. We have no desire to mislead. The statement above alluded to is taken from the address, and is as follows, viz:

	1st class freight per ton per mile—average in cts. and hundredths of a cent.	2d class freight per ton per mile—average in cts. & hundredths of a cent.
Maine	5 68	3 38
New Hampshire	5 25	5
Vermont	4	4
Massachusetts	5 57	4 54
Rhode Island	6 37	4 39
Connecticut	5 75	3 50
New York	9 04	5 79
New Jersey	13 57	11 66
Pennsylvania	6 75	5 35
Maryland	4 56	3 12
Virginia	10 44	4 69
North Carolina	9 83	6 37
South Carolina	10 75	5 50
Georgia	9 33	4 78
Kentucky	9	9
Mississippi	24 30	17 30
Alabama	16 33	8
Ohio	6 60	4 62
Indiana	8	5 81
Michigan	8 44	6 50
	20)179 46	20)190 30
	8 97	6 15
		8 97
		2)15 13
Average		7 56

Which shows an average charge on the 117 other American railroads, of 7·56 cents per ton per mile, while *they* charge only, according to their own account, 1·29 cents per ton per mile! or only about one-sixth as much as is charged by other railroads!!

Septimus Norris & Henry Baemeisters' Locomotive Boiler for Burning Anthracite Coal.

Philadelphia, August 28, 1848.

D. K. Minor, Esq.,

Editor of the Railroad Journal:

Dear Sir: I take the liberty of sending you a description of a new locomotive boiler, for burning anthracite coal; and if you think it worthy of a place in your valuable Journal, it is at your service.

Very truly yours,

Septimus Norris.

The form of boiler hitherto used for locomotive engines is admitted to be, by its construction, peculiarly adapted to the burning of all those varieties of fuel which contain a considerable per centage of volatile matter, such as wood, and more particularly bituminous coal. The radiant heat emitted by this class of combustibles is, as experience has shown, less available than the heat going off with the gaseous products of the combustion.

From this it appears, that a boiler having only a small part of its heating surface exposed to the direct radiating influence of the fire, but presenting to the gases evolved from that fire the greatest possible amount of cooling service, will answer perfectly well the purpose of using to advantage the above named sorts of fuel, and such is the construction of the common locomotive boiler, that the grate is surmounted by a fire box of very limited width and length, but of considerable depth; it is therefore obvious that such a fire box will receive very little heat by direct radiation, for it is only the small top, or crown sheet that is struck by the caloric rays in a perpendicular direction, whereas these rays fall upon the vertical faces of the fire box only in an oblique direction.

On the other hand, from the fire box the gases enter a large number of tubes of small diameter, and are thereby subdivided in such a manner that the heat they contain is most effectually absorbed by the contact of that large surface. But the great peculiarities that make the construction of our boiler so well adapted to the burning of wood, or bituminous coal, tend to unfit it in a great degree for the use of anthracite coal. This is apparent from a consideration of the chemical properties of anthracite. Bituminous coal or wood, as already remarked, contains a considerable quantity of volatile matter, anthracite is almost destitute of it. The action of these two classes of fuel shows therefore a very striking contrast, the heat of the former is diffusive, of the latter highly concentrated; in the former only a small portion of the caloric is given out by radiation, whereas a large quantity is carried off by the gaseous products of the combustion, in the latter a large quantity of intense heat is radiating heat, and but a moderate quantity is carried off with gases; in the former the heat evolved from the grate (the combustion going on at the usual rate) is comparatively moderate, in the latter (at the same rate of combustion) extremely intense; and so diametrically opposite are the peculiarities of these two classes of fuel, that the necessary inference is, that for the advantageous use of anthracite coal a boiler is required essentially different in its construction from the one used for bituminous coal or wood.

It is true in most cases it has been deemed necessary to allow a large area of grate in boilers intended for burning coal, but the advantage obviously gained by such an arrangement has been confined within too narrow a limit, by the necessity of making the length of the grate dependent on the distance of the coupled wheels of the engine.

In constructing the improved locomotive boiler, it has been our aim to overcome all these difficulties, arising from the above named causes. For this purpose the fire box is given such a position and shape as to effectually fulfil the following conditions.

1st *The radiant heat shall be available in the greatest possible degree.*

For this purpose we have given the sheet rising over the grate and exposed to the immediate effect of the radiant heat, the section of a slightly arched vault, reducing its vertical sides to a minimum, and have moreover placed this vaulted fire box in the greatest possible depth below the surface of the water in the boiler. The beneficial effect produced by the latter arrangement, will appear from a consideration of what may be termed the fundamental principles of heating.

If a vessel be filled with water, and its temperature raised by applying some source of heat to it, the heated and therefore lighter particles will have a constant tendency to rise to the surface, while the cool and consequently heavier particles will sink to the bottom part of the vessel. Hence it appears that if a heated sheet (as for instance the crown sheet of a fire box) is introduced into a boiler near the surface of the water, the highest stratum of the water will be effectually heated by it, but the strata situated below the heated sheet will never come in contact with it, as they have no tendency to ascend and change places with those already heated. Such is actually the case with the fire box of the common locomotive boiler, in which the crown sheet (almost the only part receiving radiating heat from the grate) is but a few inches below the water line. But suppose now the crown sheet to be brought into the greatest possible depth below the water line, the effect will be very different from what it was in the former case, the particles of cold water as soon as introduced into the boiler will naturally gravitate towards the heated sheet, and after having taken up from it a certain quantity of heat, will rise to the top again with the same energy to make room for a renewed stream of cold water, and a most energetic circulation will be kept up in this manner as long as any radiating heat will be imparted to the top sheet of the fire box. Now in our boiler the fire box occupies such a position that it cannot fail to produce the described effect, and by its construction and position will most effectually absorb the radiant heat issuing from the grate underneath, and give it off to the water above.

2nd. *The concentration and intensity of heat shall be counteracted to any desired amount.*

This is effected by spreading the fuel over a large grate surface, and carrying on the combustion slowly. The extension of the grate surface has certainly suggested itself to all those who have reflected on the construction of anthracite boilers, as one of the first conditions for the successful use of that fuel; but as observed before their endeavors in this respect have been partially counteracted by the necessity of making the extent of grate surface dependant on the distance the driving axles are placed from centre to centre. We overcome this difficulty at once by placing both grate and fire box below the driving axles, thus making their length independant of the distance of the latter. Aside from the economical effect arising from slow combustion (which is considerable, as every one acquainted with the Cornish

system will admit,) there is another advantage gained by this system which is of great importance in locomotive engines; this consists in partially dispensing with the necessity of using very narrow blast pipes, in order to increase the draught. With large grate surface and slow combustion we are enabled to make use of blast pipes of so large a diameter, or in other words to have so small an amount of artificial draught in addition to the natural one, that the current of air introduced between the grate bars will resemble more the uniform blast of a blowing fan, than the fitful jets of air caused by the use of narrow blast pipes. Although the shape and construction of the boiler must be admitted to be calculated to fulfill the conditions named under the above heads, 1. and 2., thereby enabling us to overcome the main obstacles to the successful use of anthracite coal; yet these are not the only advantages derived from the construction. A very prominent, though incidental quality of our boiler is to have its centre of gravity more favorably situated than in boilers of the usual construction. This will appear from a comparison of the two diagrams, representing the old and new form of boiler. In Fig. 1. the centre of gravity is situated in a vertical line A B, very near the fire box. In whatever position the wheels may be placed, it is impossible to distribute the weight within any degree of uniformity. In

Fig. 1.

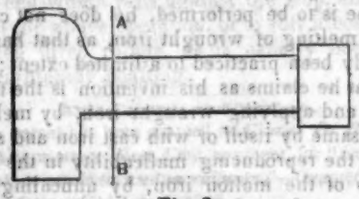


Fig. 2.

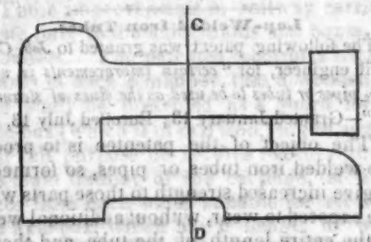


Fig. 2. the case is clearly different. In the first place by the reduction of the diameter of the upper cylindrical part of the boiler and the addition of the lower part, the centre of gravity is thrown into a lower position, and again by the reduction of size and weight of the left part corresponding to the fire box in the old boiler, and by bringing the fire box, with the additional weight of grate bars and fuel, on the right side, the centre of gravity is brought in a vertical line c D, which very nearly bisects the length of the boiler, thereby making it easy to distribute the weight uniformly on the wheels. Another advantage will arise in the construction of this boiler in relation to the tubes and tube sheet which in the present construction of boilers is certainly liable to be burnt out and the ends of tubes cut by the constant friction of the coal cinders, and small particles of coal, passing through the tubes and striking the ends. In the improved boiler the tube sheet is placed in such a position that the cinders must first strike a large surface, at the extreme end of the fire box, and then make a turn before reaching the tube sheet, which must effectually remedy this great evil, as found to a great extent, in the common locomotive boiler.

[From the Philadelphia "Commercial List."]

Pennsylvania Coal Trade for 1848.

From the Lehigh Mines.

The amount of coal shipped from the Lehigh mines during the week ending the 26th ult., and since the opening of the navigation, has been as follows:

	This week. tons.	Total this year—tons.
By Lehigh company, Aug. 28.	8,338 00.	150,067 09
By Room Run ..... "	3,640 15.	75,343 00
By Hazleton.....	3,446 00.	60,291 00
By Beaver Meadow.....	2,297 09.	51,655 00
By Spring Mountain.....	2,189 12.	45,715 00
By Buck Mountain.....	2,535 00.	41,500 18
By Cranberry Mines.....	....	7,880 00
White Haven.....	206 01.	5,696 16
Sugar Loaf.....	188 08.	381 06
Total.....	22,841 05.	438,530 09

From the Schuylkill Mines.

The amount of coal forwarded by Reading railroad during the week ending the 31st ult., and since the 1st of January, has been as follows—

	Tons.
From Schuylkill Haven.....	10,033 19
" Pottsville.....	4,887 09
" Port Carbon.....	7,491 17
" Port Clinton.....	2,695 01
Total this week.....	25,078 06
Total this year.....	852,874 15

The amount of coal brought to market by the Schuylkill canal during the week ending the 31st ult., and since the opening of the canal, has been as follows:—

	Tons.
From Pottsville and Port Carbon.....	8,343 01
" Schuylkill Haven.....	3,306 16
" Port Clinton.....	990 15
Total this week.....	12,940 12
Total this year.....	273,954 19

Recapitulation.—Total Shipments this Season.

By Lehigh companies.....	433,530 09
By Reading railroad.....	852,874 15
By Schuylkill canal.....	273,954 19
By Delaware and Hudson canal.....	244,649 00
Total.....	1,810,009 03

Wabash and Erie Canal.

The Cincinnati Gazette of 31st August says "we have before us a circular from the president of the board of trustees of the Wabash and Erie canal, in Indiana, containing a statement of the affairs of the trust for the six months enning the 1st of July, 1848. This shows that the trustees had on hand, the 1st of December, 1847, a balance of..... $483,511 50
Received since, from all sources..... 101,093 31
584,604 81
Disbursements—expenses, construction, repairs and interest on loan..... 226,321 88
Balance, July 1, 1848..... 358,282 93
The amount of tolls and water rents, for the six months ending the 1st of July, 1848, is..... $46,285 07
Amount received in year ending do.... 124,027 12
" " " July, 1847.. 102,850 57
Increase in 1848..... 21,436 55

"The canal is navigable 189 miles, from the state line to Lodi, or Coal creek, on the Wabash, and the difficulties in the supply of water between Lafayette and Lodi are mostly overcome. The line between Lodi and Terre Haute, 36 miles, will be completed and ready for navigation in the spring, at a cost less than the estimates. From Terre Haute to Pt. Commerce, 42 miles, was placed under contract in May last, with a navigable feeder of five miles, making in all 47 miles to be completed in 1849. A further letting from Point Commerce to the west fork of White river, will take place on the 15th of November next, including a dam across the river and a guard lock. Seventy-eight miles are now under contract and 90½ yet remain to be let during this and the next year.

"The balance of the trust fund on hand is deposited at an interest of from 3½ to 4½ per cent.

"Payment of the balance on the subscription to the loan of $800,000, will be required in the year 1849, of which notice will be given. The amount to be paid, $48 25 on each bond of $1000 subscribed and surrenaered."

Iron Truss Bridges.

The Albany Evening Journal says that "Mr. Rider, the inventor of an iron suspension bridge, has a model at Thompson & Co.'s express office, which our citizens are invited to examine.

"We understand that the Pier company have been looking at this model in reference to the bridges they are about to construct.

"The strength of these bridges have been fully tested upon the Harlem railroad. Our judgment in such matters, is worth but little, and we only venture to call the attention of scientific and practical men to the improvement."

In relation to Mr. Rider's truss bridge we can say that we have been under one of them when a locomotive and train of cars passed over it, and could not discover any material depression and very little vibration.

The plan appears well calculated for strength and economy—and there need be no fear of accidents from *fire*—three important recommendations to railroad companies.

We expect soon to have a full description of the plan, when we shall have more to say in relation to it.

Copper Mining on Lake Superior.

The last number of the Mining Journal has the following in relation to the "Cliff Mine."

This mine has had in successful operation, for several months past, a stamping machine, for dressing and concentrating that part of the metal raised, which was so mixed up with earthy substances as not to be in a proper state for sending to market. During the last month an accurate account was kept of the cost of running the stamps, and an estimate made of the value of the product. The result is as follows:

Cost of running stamps	$482
Estimated value of the product,	3566
Profit,	$3084

The whole amount stamped was 232 tons, from which it would seem that its quantity of mineral before being concentrated, is about 5 per cent. From the results as above stated we should judge that a much larger profit must be made on this part of the mineral taken from the mine, than is yielded by the large masses or sheets of copper. They certainly establish its value for working. A very large amount of the mineral raised from the different lake Superior mines, has consisted of a mixed substance like that stamped at the Cliff mine with from five to fifteen per cent. metal. Several experiments have heretofore been tried for reducing it, but until this recent one without success. From this cause many had concluded that it was of no value, and that therefore a large part of the work-

ings of the mines being useless, a profit could never be derived from them. This experiment of the Cliff mine is therefore of great importance as establishing a contrary conclusion. The "Goliah," which left the Sault on the 7th of August, brought down about two hundred and fifty tons of copper from this mine. There have arrived at the Sault the present season from the mine about six hundred and eighty tons, and it is estimated that the whole of its shipments during the season will be not far from nine hundred tons.

Pennsylvania Railroad.

This company are preparing for work. They have, we understand, contracted with Messrs. Kimball and Gorton, for seventy-five eight wheeled burthen cars, to be placed on the road as soon as a portion of it is opened for travel. It is intended that every facility shall be afforded to the transportation of produce and merchandise upon the Central road, and the work will be pushed forward to completion at the earliest period consistent with its durability.

Within the year 1850 there will be a line of railroad cars direct from Philadelphia to Pittsburgh, and then to Columbus and Cincinnati, Ohio, if we may judge from the following letter from S. W. Roberts, Esq. This looks like extending the line in the right direction. This, if prosecuted and extended, will form a *central* line through *Ohio, Indiana* and *Illinois*, to St. Louis—but it will not *terminate there*.

Letter from the Chief Engineer to the President of the Company:

MASSILLON, OHIO, Aug. 26th, 1848.

Col. Wm. Robinson, Jr., Pittsburg:

DEAR SIR:—The rapid progress of the Pennsylvania railroad from Philadelphia to Pittsburg indicates that the time has now come for constructing the connecting link between it and the railroads of the west.

Under the liberal charter granted for the purpose by the legislatures of both the states of Ohio and Pennsylvania, at their last session, the surveys were commenced under my direction at the Mouth of Big Beaver, on the 11th of July; and they have now been extentended from the place of beginning, on the Ohio river, to the town of Massillon on the Ohio canal. The distance between these two points by our experimental line, is seventy-six miles; and, if we add twenty-five miles for the railroad distance from Pittsburgh to Beaver, it will make the distance from Pittsburgh to Massillon one hundred and one miles; which does not materially differ from the length of the road now usually travelled. This line has been traced on what is called the northern route, passing near Darlington, in Pennsylvania, and Salem, Damascus and Canton, in Ohio; the distance from Beaver to Salem being thirty nine miles. It passes through a well cultivated and populous country, having no navigable communications, and presenting great facilities for the construction of a railroad, which may be made at a moderate cost, especially west of the state line. Near Darlington we found an abundance of both bituminous and cannel coals of excellent quality.

As soon as the necessary surveys can be made, and the requisite data obtained in reference to the middle and southern routes, by the valleys of Little Beaver and of Yellow creek, we shall be in a position to make a fair comparison of the relative merits of these three lines; and in making a choice between routes which may be equal, or nearly so, in an engineering point of view, the amount of local subscriptions to the stock along the line and the amount of way trade and travel that the country can furnish to the road, should have their due weight in determining the selection.

The surveys will soon be extended westward to Wooster, Mansfield and Bucyrus, and connecting with the railroad lines, completed and in progress, running southward to Columbus and Cincinnati, and northward to Cleveland and Sandusky.

This road will thus become a back bone line, of which a number of other roads will represent the ribs, and in this way its connections will be extended throughout the state of Ohio. Under the charter, the company can construct first such parts of its road as will pay the best, but care should be taken to commence no part of it until the board feel certain of obtaining the funds required to bring it into profitable use.

To the people of the cities of Pittsburgh and Allegheny, this line will be of the first importance, for it will be the direct road to their best customers; and it commends itself to the good feeling, and ought to receive the subscriptions, of the citizens generally of both the great, free states whose names it bears—because, by bringing them into a close and peaceful union, it will add vastly to their commercial power. If due diligence and energy are exercised in conducting the affairs of the company, I believe that those who live but a few years will see the Ohio and Pennsylvania railroad become one of the most important, one of the most thronged, and one of the most profitable thoroughfares to be found in our country.

Very respectfully,
SOLOMON W. ROBERTS,
Civil Engineer.

Improvements in Wrought Iron.

We find the following article on this subject in the Railway Chronicle. The editor says:

We extract from the *Mining Journal* the last recorded improvement in wrought iron: The patentee, in desribing his mode of treating wrought iron, commences by stating that he takes scrape, or pieces of wrought iron, and melts them in a cupola furnace with a soft fan blast, or in a reverbatory furnace, in the same manner as pig or cast iron is melted. If small quantities are required to be melted, a pot or crucible furnace will be most convenient; and having moulded the article to be made in the manner usually practiced in iron foundries, he pours the molton iron into the mould. The article thus made being hard and brittle, and deficient in the malleable property, Mr. Rocke proposes to treat, or anneal, in a furnace, such as is used for converting bar iron into steel, or other convenient furnace, or kiln, in which the heat can be regulated, so as to restore the malleable property; and the articles to be so treated he places within a box of iron, surrounded by bricks, or within a casing of bricks, leaving space to surround it with Cumberland red ore, or other iron ore, or charcoal, mixed together, and ground fine; or the articles may be covered with this mixture without such casing, and in this state he submits them to a sufficient degree of heat to restore the malleable property—and to determine the state of the process, the patentee employs a trial bar, which may be withdrawn from time to time, to ascertain the degree of malleability which the mass attained. For making articles which do not require to possess the density and texture of wrought iron alone, he mixes therewith cast iron in various proportions, according to the nature and requirements of the article, taking care that the proportion of cast iron, in no instance, exceeds the weight of the wrought iron; and in making articles which require to take the nature and temper of steel, he mixes with the wrought iron steel in various proportions, according to circumstances—the proportion of the steel never exceeding the weight of the wrought iron; and he pours the moulton metal into moulds, and subsequently submits it to the annealing process in the manner before described. In conclusion, he states that, having described the nature of his invention, and the manner in which the same is to be performed, he does not claim the melting of wrought iron, as that has already been practiced to a limited extent; but what he claims as his invention is the treating and applying wrought iron, by melting the same by itself or with cast iron and steel, and the reproducing malleability in the castings of the molton iron, by annealing the same as above described.

Lap-Welded Iron Tubes.

The following patent was granted to *Job Culler*, civil engineer, for "*certain improvements in welded iron pipes or tubes to be used as the flues of steam-boilers.*"—Granted January 13; Enrolled July 13, 1848.

The object of the patentee is to produce lap-welded iron tubes or pipes, so formed as to give increased strength to those parts which are exposed to wear, without additional weight to the entire length of the tube, and thereby to obviate the evils to which boiler tubes are at present exposed. He makes the internal diameter of the tube greater at one end than at the other, instead of its being the same, or uniform throughout, as has hitherto been the case; the external diameter remaining, however, the same, and uniform throughout the entire length of the tube. The tube will, of course, be cylindrical upon the exterior, and conical upon the interior surface. The increased thickness of metal at the one end is to be drawn from the remaining portion of the entire length of the tube. And further, the operation is effected at one heat, so that the ductility of the iron of which the tubes are composed shall remain unimpared.

The *modus operandi* is as follows.—The patentee employs a series of grooved rolls, moved by suitable toothed wheels, and a mandril, with a conical bulb or head, the stem of which is of increasing diameter towards the opposite end. The skelp, after being properly prepared, as is usual in the manufacture of lap-welded iron tubes, is heat-

ed and passed between the first of the series of rolls. It is then welded over the conical bulb, and forced, at the same time, over the stem of the mandril. This mandril is held by a grip, attached by a hinge thereto in a stop, so as to allow of its being lowered and passed, after the conical bulb has been removed between the second series of rolls, the diameter of the groove of which is smaller than that of the first series. The tube, with the mandril still inside, is then passed through the third series of rolls, the groove of which is smaller than that of the second series. The object of these successive rollings, after the skelp has been welded on the mandril, is to remove any irregularities upon either of the surfaces, and to make the edges of the tube perfectly smooth and uniform. The tube is then taken to the drawing bench, in front of which is a stop, and against which the pipe rests. The stop is furnished with a hole to allow of the passage of the grip of the mandril, which is held by a pair of pliers; and the bench being made to move while the pipe remains stationary, the mandril is withdrawn. When it happens that the mandril adheres too tightly to the tube, it is proposed to heat it in a muffle or furnace, then to cool the end which rests against the stop, and repeat the above operation, or to roll it cold between three rollers, as is usually done in straightening shafting.

Axle Guards and Buffers.

A patent has been granted to *Charles De Bergue*, of Arthur street West, City, engineer, for "*improvements in carriages used on railways*."—Granted January 5; enrolled July 5, 1848.

These improvements in railway carriages relate only to the axle-guards and boxes, and to buffers. The patentee constructs his axle guards in such a manner, that a wooden surface shall be presented as a guard for the axle-box (which is of cast iron,) to rub against. For this purpose he secures two uprights to the main framing of the carriage, at a distance from each other suitable for receiving the axle-box, which has a flange, its whole depth on each side embracing both sides of the uprights. These wood uprights forming the guard, are strengthened by plates of iron placed on each side, the width of such plates being less by the breadth of flange on the axle-box, than the wood against which they are bolted; thus the face of the axle-box slides flush with the face of the axle-guard. The upper parts of these plates are carried up the side of the frame, to which they are secured. The springs are of the kind previously patented, and consist of a series of India rubber rings, separated by plates of metal. This spring is placed between the uprights of the axle-guard, the bottom plate being supported by a vertical rod resting in a step on the axle-box, immediately above the centre of the bearing, being within the grease-box, which forms part of, and is cast in one piece with, the axle-box. The wood faces of the axle-guards and the chase in the sides of the axle-boxes must be rendered particularly smooth, in order to prevent abrasion of the surface of the wood. The second improvement consists of a mode of making the conical centres of plates used for separating the rings of India rubber in the buffer and other springs. In making these plates, the patentee forms a thin disc of metal of the required diameter, having a hole in the centre larger than is necessary, to go over the buffer-rod; he then incloses this plate in a suitable mould, in which is poured a quantity of soft metal, such as zinc and tin, in order to form the conical centre of such separating plates. The soft metal mould being larger in diameter than the hole in the centre of the plate, it consequently becomes securely imbedded in the soft metal centre, which is cast with an opening suitable to receive the buffer rod or other spindle, according to the purpose it may be intended for. The third part of this invention relates to what the patentee denominates a long-range buffing apparatus, which is applied to a van or truck placed between the engine and tender and the train of carriages, in order to protect the train as much as possible from violent concussion. The range of resistance in this apparatus is to the extent of several yards, and unlike other buffers, it is not attended by any recoil. The resistance is produced by the friction of straps passing over a drum, which straps are so arranged in connection with levers and a train of wheels, that as the force of the collision increases, the straps are tightened and the resistance is augmented.

Atmospheric Railway.

A patent has been granted to *William Froude*, of Darlington, Devon, civil engineer, for "*improvements in the valves used in closing the tubes of atmospheric railways*."—Granted January 5; enrolled July 5, 1848.

The material which is employed in this invention for closing the split in the tube, is vulcanized India rubber; and the advantage proposed to be gained is the dispensing with any unctious substance for keeping the valve air-tight. Flat valve-seats are formed on each side of the slit, both of which are bounded by vertical flanges; the right angles formed by the vertical flanges and the valve-seats being rounded off, and the valve seats slightly recessed by shallow circular recesses, which thereby form the hinges or centres of motion of the valves. There are two valves employed, the lower portion is composed of plates of iron, of about eight inches in length each plate, the shape of the lower surface of which agrees in contour with the seat upon which it is placed; the one edge of the plates forming, with the shallow circular recess in the seat, the hinge or centre of motion. The other edge of the plates is nearly over the centre of the line of opening, thereby nearly meeting the edge of the opposite plate upon the other valve-seat. The under side of the plates over the aperture, is formed of the same curvature as the inside of the tube. The upper surfaces of these plates are flat, except that part over the aperture immediately adjoining the edge, where it is lower than the part over the seat. Upon these plates are placed a continued sheet of vulcanized India rubber, which extends from beyond the centre of the line of opening or aperture over the whole surface of the plates up the inner side, and also on the top of the vertical flange. The portion of the vulcanized India rubber sheets which are over the line of opening, are increased in thickness, and fill the whole of the depressed part of the plates, thereby forming at that part a thick pad. The upper surface of the vulcanized India rubber is covered with canvas. Above the vulcanized India rubber sheets are placed flat plates of iron, of similar length to those beneath and lying over them; they are securely rivetted together, thereby holding firmly between them the vulcanized India rubber. The vulcanized India rubber is secured to the side and top of the vertical flange by means of a series of iron bars, which are bolted to the flange, and which are to be about 15 feet long, which secures that edge of the valve air-tight, or nearly so. When the valves are firmly pressed upon their seats, the edges of the vulcanized India rubber pads in contact are below a line drawn between the centres of motion of the two valves, whereby the tendency of the elasticity of the pads will be to further press the valves upon the seat instead of raising them therefrom. The patentee proposes to employ, for the purpose of opening the valves for the passage of the bar connecting the piston apparatus with the carriages, a series of not less than five wheels placed in advance of the connecting bar, and the other at intervals of about two feet from centre to centre. After the passing of the connecting arm, the valves are lowered and closed over the opening by a wheel attached to the upper part of the connecting bar, or to the carriage, in such manner as to run over the valves, and thereby press them down upon their seats, where they are securely retained, and effect an air-tight, or nearly air-tight, joint.

Coal Instead of Wood for Locomotives.

A writer in the last number of the American Mining Journal, has the following remarks on this important subject; and we give them a place in the Journal, and ask his attention to the communication of Mr. Norris, with illustrations of a locomotive boiler, designed for burning anthracite coal. Mr. Norris thinks that he has succeeded, and we sincerely hope he has, in overcoming difficulties heretofore encountered in using this cheap and convenient fuel; and we desire to call the attention of those who are more competent than we are, to it. Examine it thoroughly, and give your views of it to the profession through this Journal.

If Mr. Norris has succeeded, as he thinks he has, he *deserves well* of the *entire railway interest* of the country, and we hope he may be remembered, and liberally patronized, in his new locomotive establishment, soon to be in operation at Schenectady, N. Y.

Desolation of New England Forests by the Modern Mastodon or Mammoth.

In the far west, the wild aborigines, and some geologists, perhaps quite as wild in their speculations, indulge in the tradition that the ancient mammoth fed upon forest trees, instead of eating grass like an ox, and in that way produced our present almost interminable prairies.

However this may have been we cannot say, but one thing is certain, that a devasta-

tion similar to that existing in the imagination of the Indian, is in reality fast spreading over the hills of New England; and the glory of her primeval forests and wondrous summits, will soon disappear forever. The monster committing these depredations, with the fleetest pace, traverses the whole length of our vallies, and like Behemoth of old, has "bones as strong pieces of brass, and bones as bars of iron." "The mountains brings him food" while "all the beasts of the field play" and gambol at his approach.

In short, so great is the destruction of trees and timber along our railroads, that the mournful song of "Woodman spare that tree," is already resounding from hill to hill; and some provident land owners have commenced planting forest trees for reproduction; justly fearing that our land, divested of her forests, like Sampson shorn of his locks, will soon become weak and powerless.

The time required for trees to obtain their average full growth for strength and durability, is from one hundred to one hundred and twenty years; for the purposes of fuel, not less than twenty-five to thirty years. For our railroad companies to think of making such dreadful havoc of our beautiful woodlands, is, in our view, improvident in the extreme, both for themselves and the country. The supply, certainly, in New England, will soon be exhausted, and they must then seek a substitute. What this substitute shall be, is a matter of vast importance to the railroad community, and the public at large. When the ocean came to be navigated with steamers, the great question was agitated, What is the most economical and appropriate fuel? The same question is quite as important in regard to our overland transportation. The cost of railroad fuel in the State of Massachusetts alone, the present year, will probably not fall much short of one million of dollars. But when we think of the roads and branches contemplated as finished, what an augmentation of fuel will they require! In and near the State of Connecticut there are, or will soon be completed, six parallel railroads, besides the "air line" already nearly finished from New York to New Haven. These roads are the Harlem and Hudson River, the Housatonic, the Naugatuck Valley, the New Haven and Hartford, the Norwich and Worcester, and the Stonington railroads. The State is also intersected by Connecticut river, whose shores have long supplied fuel for steamboats. The prospect of Connecticut is the complete destruction of her forests; and here it is that the inhabitants are wisely planting trees for reproduction.

Even in the interior of Pennsylvania, the Reading railroad, leading from Philadelphia to the coal region, last year consumed daily about two hundred and ninety cords of wood, (deducting Sundays,) through the year, making a sum total of more than ninety thousand cords, at a cost of more than three hundred and seventy thousand dollars. The amount of transportation effected by this consumption of fuel, was one million seven hundred and seven thousand nine hundred and sixteen tons. Assuming the Reading railroad to be one hundred miles in length, the same amount of wood burned on the large western steamboats, would have transported four millions three hundred and twenty thousand tons the same distance, against the mighty current of the Mississippi. By trial on board these boats, seven bushels of coal are found equal to one cord of wood, in generating steam. At this rate, allowing thirty bushels of coal to weigh a ton, twenty-one thousand tons of bituminous coal would effect the above amount of transportation; and at the rate of six dollars per ton, would only cost one hundred and twenty-six thousand dollars, instead of three hundred and seventy-one thousand, making a difference of two hundred and forty-five thousand dollars in the cost, and of course, in the profits or dividends. Now, as a single locomotive has been made to draw at once a burden of more than four hundred tons on the Reading railroad, I have no doubt that by the proper application of the proper fuel, these engines may be made to effect transportation overland nearly or quite as cheap as steamboats against the current of the Mississippi. But of this I design to speak more fully hereafter; and in the mean time, Mr. Editor, I desire you to furnish me the exact length of the Reading railroad, and also as many facts as possible relative to the fuel expenses of railroads generally, and much oblige Yours, truly,

A. R. R. CONDUCTOR.

Copper Smelting and Copper Mining.

A writer in the Pittsburg Gazette of 30th August says:

We visited, on Monday, the new furnace erected by Messrs. Hussey & Avery, stockholders in the Cliff mines of lake Superior, for the purpose of smelting their ore at home. The ore used is partly in the large native masses, some weighing several tons, and partly in the shape of what is called "stamp ings"—that portion of the ore intermixed with rock, being stamped or broken apart by machinery at the mines, washed clear of the rocky fragments, and barreled or otherwise packed for shipment. The ore is brought here by way of the lakes and canal, and landed just at the furnace, which is erected on the banks of the Monongahela, on part of Dr. Gazzam's farm, near the first dam. The ore yields, so the workmen inform us, from 80 to 90 per cent. of pure copper. The chief workman also informed us that the pickings of the ore alone yielded over three pounds of silver per diem, and a much larger amount of silver could be obtained, as soon as further arrangements should be made for separating the silver from the copper, (by a chemical process, we believe.) The process of smelting is a very interesting one to the spectator. Common bituminous coal alone is used in the furnace. The business seems to require very few hands, and they have a clean, pleasant kind of work, in the main. The copper, when ready for moulding, is ladeled into little iron moulds, which are suspended by a hinge on an iron rod, running across a square cast iron vessel, filled with water. As soon as the metal has cooled a little in these iron moulds, they are tilted over so as to throw the copper into the water, where it cools, and is taken out in smooth ingots, in shape like a brick, and weighing from 14 to 18 pounds. The least pleasant part of the business seemed to be the pouring of the hot metal from the ladles into the moulds, and we were a good deal amused with the twitchings and ugly faces of one fine, burly looking workman, whose fear of being scalded by the spattering metal seemed to have its origin in a little painful experience.

The business being but commenced, very little has been yet done in the way of erecting buildings, but the gentlemen engaged in the enterprise have ground sufficient to extend their operations as may be required. They have a pier running out into the Monongahela, with a crane for lifting the ore from the boats, and a neat railway for conveying it into the smelting room. Everything seemed to be working admirably. The furnace turns out about five tons of copper at a blast. The ingots look much more solid and smooth than any that we have seen before, and are of a very convenient size for handling.

We had supposed that the ore might be more profitably smelted at the mines, but owing to the scarcity of fuel, and the high price of labor at the ore beds, it is found advantageous to convey it here in the native state.

The following, from the Lake Superior News, of August 18th, will afford some criterion of the extent of the mining operations on lake Superior.

"The propeller Goliath, Captain Palmer, cleared from this port for Cleveland and Buffalo, on the 7th inst., with 256 tons of copper from the Cliff mine, of which 82 tons were consigned to Thomas M. Howe, Pittsburgh, via Cleveland, and 174 tons to D. Kenner of Baltimore, via Buffalo.

"The whole amount of copper that has been shipped this season from lake Superior up to this time, is 1,362,000 pounds of nearly pure copper."

Railroad Demands for Money.

We find the following article on this subject in the American Mining Journal of 29th August. The views therein expressed are sound, and entitled to respect—and we therefore commend them to the attention of those who desire to make good and improving investments.

An article appeared in the Boston Atlas a few days since, in which it seems to be assumed, that but for the railroad demands, the present condition of the money market would be easy and settled. That the calls for money on the part of the railroads, add to the existing embarrassments, there can be no doubt; but this is true of every interest or branch of business requiring the continued use of capital to sustain it or carry it on. The more multiplied and extended these interests and branches of business, the greater and more complicated are the evils which a derangement in the money market occasions, and the more difficult is it to bring about a restoration to a healthful condition of things. The removal or obviating of any single difficulty experienced, is only a mitigation or lessening of evils, but cannot operate as a general remedy. It is, as when the whole

system is effected with disease—a relief of any one part may check its violence and intensity, but no radical cure is effected until soundness and health is restored to every part.

To seek, therefore, an explanation of a state of things produced, in that which is a consequence merely thereof, is as unphilosophical as it is to attribute that for a cause, which results only as an effect.

It is not our present purpose to inquire what are the causes which have led to the derangement in the money market, as it now exists. We only propose to offer a few considerations which, in our opinion, tend to establish the fact, that the large investments of capital in railroads have had no productive agency in this derangement. It is impossible so to apportion out the capital of a country as to assign to every interest and branch of business its own proper and distributive share. This is a matter, however, which regulates itself; or is conformable, rather, to those laws of business and trade by which the relations of various interests are determined and governed. No particular business can absorb a greater amount of capital than properly belongs to it, in the observance of these relations, without occasioning an over action that is injurious to itself, and becoming a general disturbing cause. The injury resulting to itself is, that the business ceases to yield a profit on its capital employed, and is clogged by its own undue enlargement. The disturbance it occasions to other interests, arises in the withdrawal from them of a portion of that vitality upon which their healthful condition depends. There are other causes than the unequal absorption of capital by some particular business, that often lead to a derangement in the money market, and affect injuriously the general interests. Foreign competition, growing out of the unequal laws of trade, and the want of protection to some home interest, may, and frequently does, occasion it. The mere fact, therefore, that any business ceases to be profitable, is not conclusive evidence that it has been extended beyond its proper relations to other interests, and by overdoing, has brought about an unhealthy condition of things. The disturbing force may be from abroad—and the evil lie in some defect of government policy. But when, during such a derangement, it is found that there is any business not so far depressed thereby, but that it continues to yield a profit on its capital, there can be no other conclusion, than that such business has had no agency in causing the derangement, and is not carried beyond its proper equilibrium. Now, how is the fact in regard to the railway interest? Has it been extended so out of proportion to other interests that an unfavorable reaction has taken place, and any serious falling off in its revenues resulted? On the contrary, at a period when almost every other kind of business has been depressed, and in part suspended, in part carried on with loss, and in part kept up with little or no profit, has not this continued prosperous, netting as large receipts, and paying about the same dividends as heretofore?

We have made up the following table from the returns to the legislature of this State in 1848, of the several railroads then in operation, in order to show the amount of capital vested in them, their net receipts, and the dividends paid by each.

Roads.	Capital.	Net receipts.	Div'a.
Berkshire.....	600,000 00	42,000 00	7
Boston and Lowell and br.....	1,800,000 00	195,147 24	8
Boston and Maine and branch	2,601,391 52	291,245 04	9
Boston and Providence and br...	2,520,000 00	187,982 53	7½
Boston and Worcester and br...	3,500,000 00	340,184 69	10
Connecticut River and br.....	800,900 00	52,415 67	7
*Dorchester & Milton.....	74,265 23		
Eastern and br....	2,650,000 00	264,757 38	8
Fall River.....	1,050,000 00	33,367 89	3
Fitchburg.....	2,116,100 00	223,010 92	10
†Lexington and W. Cambridge.....	200,000 00	8,834 11	
Nashua & Lowell.	500,000 00	60,398 04	10
New Bedford and Taunton.....	400,000 00	44,120 78	8
Norwich and Worcester.....	1,653,500 00	38,037 25	none.
Old Colony.....	1,199,300 00	84,133 35	7½
Pittsfield & North Adams.....	443,000 00	8,176 71	
‡Providence and Worcester.....	1,100,000 00		
Stoughton br. road.	85,600 00	6,128 52	3
Taunton br. road..	250,000 00	28,214 93	8
West Stockbridge.	39,600 00	1,700 81	
Western.....	5,150,000 00	302,000 00	8
	28,633,656 74	2,207,345 86	

It will be seen from the above, that the total amount of capital invested in the railroads lying wholly or in part within this State, and in operation, is $28,633,656 74, and that the amount of net receipts or profits, of these roads the last year, was a little more than 7 per cent. on the capital. The amount of capital paid in on roads not completed, as appears by the same returns, is 3,808,014 88. This makes the total amount of capital paid in as such, invested in railroads lying either in whole or in part in this State, to be, $32,441,671 62—on which capital there is an average profit of nearly 7 per cent. But to this amount there should perhaps be added some seven or eight millions of debt, owing by the different companies. As, however, the interest on this, is paid out of the gross receipts, and estimated as expenses, it is not considered as part of the permanent capital, the profits of which are dependent upon the earnings of the road. Such was the condition of the railway interest in this State at the close of the year 1847. During the first half of the present year there was no material falling off in the receipts of any of the roads enumerated in the table above, while on the part of some there has been a very considerable increase. A few of the roads not completed at the time of making up the last annual returns, have since gone into operation, and with two or three others but then recently opened, have been realising very handsome earnings. The capital invested has in the mean time been enlarged by subscriptions to new stock created by a few of the older companies to enable them to pay off certain floating debts and to make further improvements in their roads and furnish increased facilities for doing business and also by the assessements called in on the part of those roads which are in process of construction but not yet completed. The additional revenue must however, be very nearly proportionate to this enlargement of capital, so that the present relative condition of the railway interest cannot vary in any essential degree from what it was at the close of last year. If any other proofs were wanting that there has been no actual falling off in this interest, it might be found in the fact that no class of stock stands better in the market than railroad stocks. They have been found to be secure investments, yielding their increase during a period of great pecuniary embarrassments, and therefore the public confidence in them remains unshaken. At the very height of the pressure, the rights to take new stock in some of our leading roads have been sold at a premium.

Now, what other large interest is there in our commonwealth that can make such a favorable exhibit of its condition as this; that on the *whole amount* of its capital employed, has, within the last twelve months, derived a revenue of not less than six per cent? And what stronger evidence could be furnished than is presented in the foregoing facts, that the railroad interest has not yet been extended beyond the limits of its relations, and the general business of the country? If it be objected that the statements above have been taken from the railroads in Massachusetts alone, and are, therefore, limited and partial, we would reply that the amount of capital invested in them is not only relatively but actually larger than that invested in the same interest in any other State, and if the business is overdone any where it is here. We have no doubt it would be found, if the facts could be arrived at, that the condition of the railroad interest throughout the whole country is as prosperous now as it has been at any period. And yet, it experiences of the effects attendant upon the money pressure and the general decline of business, and though it has not fallen off, still it has not the growth which would belong to it in a more prosperous condition of things. The difficulty in raising money at the present time is felt by the railroad, as it is by all other interests;—but this difficulty arises, not from any diminution of the railroad revenues, but because the other usual sources of income, or many of them, are cut off. There is a large capital employed in different kinds of business, that yields no profit. Manufacturing stocks are paying no dividends; the receipts of trade have greatly fallen off, and the shipping interest does not meet its ordinary returns.—The expectations of capitalists are, therefore, disappointed, and pecuniary engagements, which have to be met, are met with difficulty and at great sacrifice. Whatever may be the remedy of this state of things, it is not in the abandonment or cutting down of those interests which are of the present contributing sources to the country's wealth.

* This road is run by the Old Colony railroad Co.
† Run by the Fitchburg railroad company.
‡ Not completed till October, 1847.

English Railway Stations.

The cost of some of the English railway stations is truly enormous. We find in a late Railway Chronicle the following account of the extension of the South Western railroad into the city.

London and South Western—(Waterloo Bridge Extension.)—This undertaking was commenced in July, 1846, the contract having been taken by the Messrs. Lee, who engaged to complete it by the 1st of July, 1848. The length of the new line is nearly 2¼ miles.—The first quarter of a mile is carried over an embankment, then succeeds a viaduct, consisting of six massive iron girder bridges and 300 arches (exclusive of those forming the present station in the Waterloo road.) These arches, which are expected to form a very considerable item in the receipts of the company, have been so carefully constructed as to be easily applicable to various purposes, and their perpetual dryness has been insured by the application of the Seyssel asphalte, which has rendered them impervious to wet. There are four distinct lines of rail, and the quantity of iron alone consumed in laying down what is technically called the 'metals,' is at least 1200 tons, independently of about 500 tons weight consumed in the erection of the bridges. In the construction of the viaduct and station in Waterloo road, upwards of eighty millions of brick have been consumed; and the present terminus, which is all on arches, covers a space of three quarters of an acre of ground, its width being 260 feet. The major part of the present terminus has been coated with asphalte, so that the arches on which it rests may with safety be made use of as storehouses, etc. The whole of the permanent way is laid down and ready for the trains to traverse; but the stations, both at the Waterloo road and Vauxhall, are not thoroughly completed, although, being for the most part wooden erections, their completion may be considered as certain at a short lapse of time. To the present terminus in the Waterloo road there are no less than four approaches for carriages and foot passengers, the pedestrians having in each approach paths 8 feet in width. At Vauxhall station, there will be two entrances. The stations at both Waterloo road and Vauxhall will be only temporary. The fares on the main line are to be increased as follows: first class, 6d.—second class, 4d.—third class, 2d. The trains will run at the present fixed times.—Nine Elms station is to be closed entirely to passenger traffic.

Tubular Bridges—Who is the Inventor?

We referred to this subject in a former number, and gave Mr. Robert Stephenson's statement on the subject. We now give Mr. Fairbairn's statement, from the "Manchester Guardian."

To the Editor of the Manchester Guardian:—Sir—It is with feelings of sincere regret that I conceive myself called upon to reply to a letter of Mr. R. Stephenson's, which appeared in your paper of Saturday last, in answer to a previous communication from Mr. Bateman. To the latter gentleman I am deeply indebted for the zeal with which he has voluntarily come forward in defence of my reputation with reference to the construction of the Conway and Britannia bridges, and I cannot but lament the necessity which existed for his friendly interference. The statements contained in Mr. Bateman's letter of the 24th ult. are perfectly correct, and, whenever the time arrives for such a purpose can be distinctly proved. Mr. Stephenson's extract from my letter of October 27, 1846, fully confirms that part of Mr. Bateman's which accords to him the merit of the "original idea." Here I must, however, stop, and in justice to myself maintain that the working out of the idea, and the development of the principle, as well as the greater portion of the construction, are the results of my labors. In carroboration of these facts, I may further state, that the original idea was a cylindrical tube, to be supported by chains, to which I was always opposed, and which, I think, I can prove would not have succeeded. In fact, it was only by a long series of inductive reasoning, founded upon experimental research, that the present strength and form of the Conway and Britannia tubes were established. That these researches are my own, and that the conclusions based upon them have been acted upon, cannot be denied; and I am satisfied that if Mr. Stephenson would reconsider the matter, and allow his feelings fair play, he would admit the fact.—The publication of the correspondence, should such a step be found necessary, will, however, prove the accuracy of these statements, whether admitted now or not. As respects that part of Mr. Stephenson's letter wherein he states, "that the company looked to him alone as responsible," I have only to observe that I was appointed by the directors joint engineer with Mr. Stephenson for the construction of the bridges. The risk which an engineer runs in incurring responsibility, is the loss of his professional reputation: I am bold enough to imagine that I am not without one; and surely, if the bridge had turned out a failure, my reputation would have suffered as well as Mr. Stephensons.

W. Fairbairn.

Manchester, June 7th.

Give *merit* its due—and not all to the first officer.

English Railway Statistics.

For 1846, 1847 *and* 1848.—*By Hyde Clarke, Esq.*

We find the following statistics in the Civil Engineer and Architect's Journal for August. It contains facts of great interest and practical utility, which ought to be understood by the people of this country, that they may *know* that their hard earnings will be safe when invested in the construction of railroads, *judiciously located, and well managed.*

There is much truth in the remarks of the writer, that "the actual increase of traffic, depends upon the length of time given for its developement." It cannot be expected that in *one*, or *two*, or, in *some* instances, *half a dozen* years, the business of a region can be fully developed; yet *time* is sure to do it, and the *increased value* of property will be, in most cases, fully equal to the outlay upon the improvement, over and above the dividends.

It is not only the increased convenience afforded for the transportation of passengers, and merchandise, and coals, but also the great advantage to be derived by the people of large cities, in receiving their provisions from distant regions of the country, in a much more perfect condition, and without the usual loss attendant upon the old modes of getting them to market. This is forcibly illustrated by that part of the article relating to the cattle traffic. It is there stated, that the *saving* on the cattle, sheep, and swine, in 1846, by transporting them on railways, instead of driving them as formerly, was 41,800,000 lbs.! and that the *feed* saved by the same change was 43,800,000 lbs.!! which alone would *sustain* a population of over 50,000 people, and far more comfortably than a large portion of the Irish people are now sustained.

We publish this statement entire, notwithstanding its length, as it is calculated to illustrate forcible the working of *our* railroad system, after a few more years of experience; and we therefore ask for it the attentive perusal of all who may be so fortunate as to see it.

☞ Possibly our friends of the *press* would do their readers good service by re-publishing extracts from it.

Contributions to Railway Statistics.

No. 1, *Passengers and Fares.*

Having published an analysis of the railway returns for 1845, I have taken the earliest opportunity after the appearance of those for 1846 and 1847, of giving a similar analysis of them, under the same title of "Contributions to Railway Statistics," which I hope may prove equally acceptable to practical men as the former series.

The following are the totals of each class of passengers in the years ending 30th June,

Class.	1844.	1845.	1846.	1847.
1st..	4,875,332½	5,474,163	6,160,351½	6,572,714
2d..	12,235,686	14,325,825	16,931,065½	18,699,288½
3d..	8,583,085½	13,135,820	18,506,527½	22,850,803½
mix	2,069,498½	855,445½	2,193,126	3,229,357
Tot.	27,763,602½	33,791,253½	43,790,983½	51,352,163

The amount received for each class, in each year, was as follows:

	1844.	1845.	1846.	1847.
1st class..	£1,432,688	1,516,805	1,661,898	1,675,759
2d class..	1,375,679	1,598,115	1,937,946	2,048,080
3d class..	483,069	651,903	1,032,206	1,286,710
Mixed....	147,858	209,518	93,164	146,733
Altogether..	3,439,294	3,976,341	4,725,215	5,148,002

The yearly increase in numbers on each class of passengers is as follows:

	1845.	1846.	1847.
1st class....	12 per cent.	12 per cent.	7 per cent.
2d class....	17 "	18 "	10 "
3d class....	50 "	41 "	23 "
Altogether..	21 "	24 "	17 "

The yearly increase in money on each class of passengers is as follows:

	1845.	1846.	1847.
1st class....	6 per cent.	9 per cent.	.. per cent.
2d class....	16 "	21 "	7 "
3d class....	34 "	58 "	24 "
Altogether..	16 "	18 "	9 "

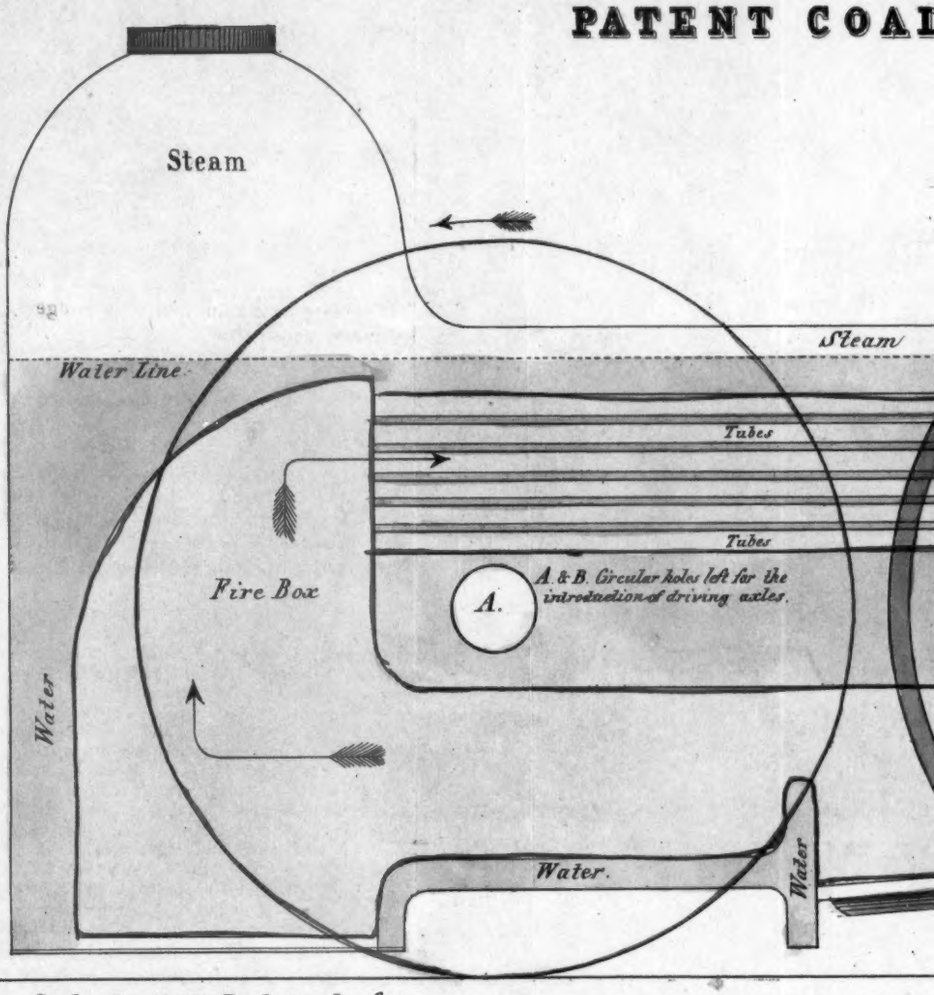
It is to be observed that no deductions can be drawn from these figures, as the railway department returns are defective and informal.

The gross returns in each year from passengers, goods, etc., were as follows:

1842-3.....	£4,535,189
1843-4.....	5,074,674
1844-5.....	6,209,714
1845-6.....	7,565,569
1846-7.....	8,510,886

According to Mr. Hackett, in Herapath's Railway Journal, the receipts for the years ending 31st December, have been as follows:

PATENT COAL



Scale One half Inch to the foot.

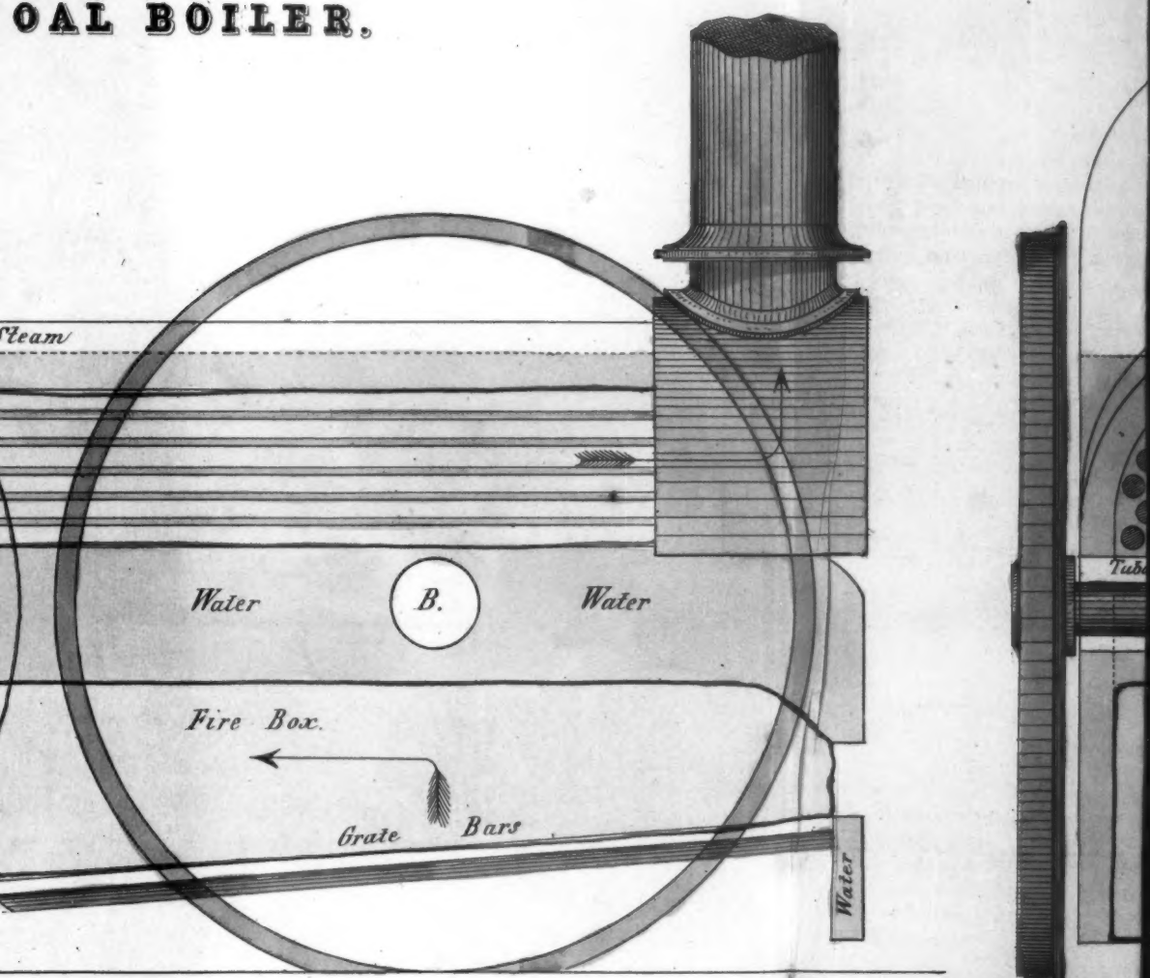
Boiler for Burning A

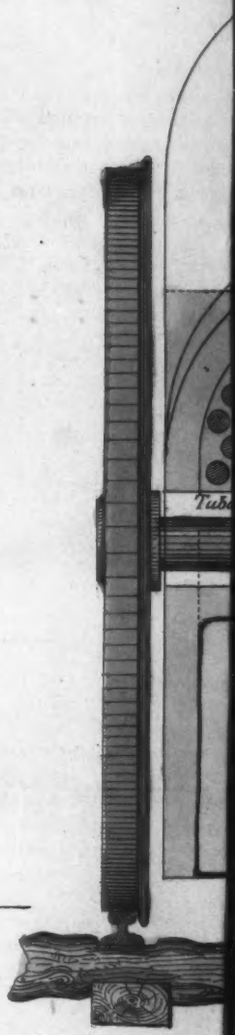
4 Drivers 8 feet diameter Grate Su
2 Cylinders 16 X 26
87 Tubes, 12 feet 3 inches long, 3 inches di

Fire surface of Tubes - 78, 970 Square in
d° d° Fire Box - 29, 153. „ „
Total . . . 108, 123 fire su

The above Fire surface will give 10 $\frac{36}{100}$
For every Cubic inch area of Cylenders

OAL BOILER.





ning Anthracite Coal.

Grate Surface. 34 Square Feet which is 19 feet more than any yet in use.

inches diameter.

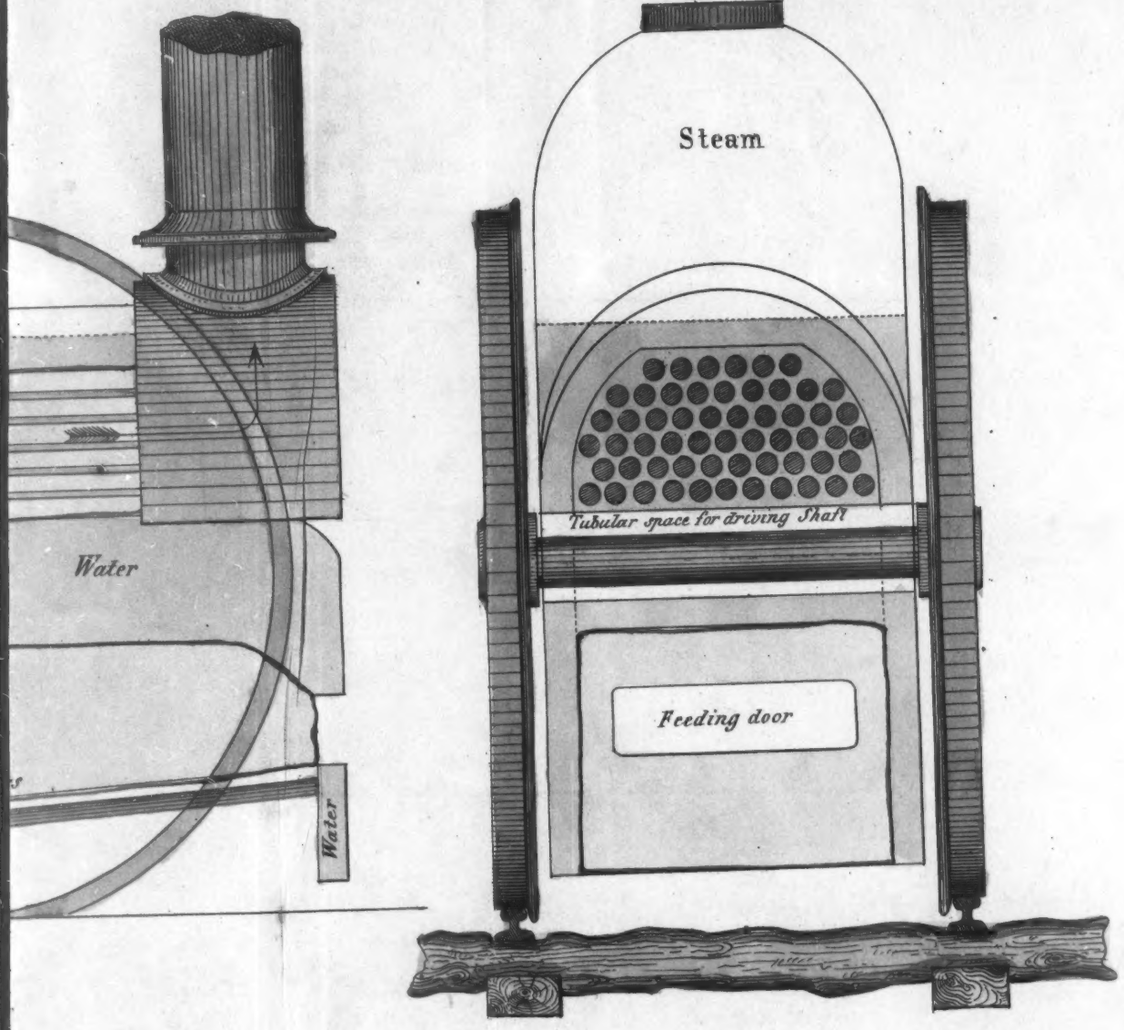
quare inches

" "

fire surface.

10 $\frac{34}{100}$ Square inches of fire surface.

lenders which is 2 $\frac{34}{100}$ above Standard.



Lith. of P.S. Duval, Ranstead Place, Phil.

1842	£4,341,781
1843	4,827,655
1844	5,584,983
1845	6,649,224
1846	7,664,874
1847	8,949,681
For the year ending 30th June, 1848	9,423,963

Mr. Hackett's totals are taken from the traffic returns published in Herapath's Journal, and do not include many small companies which make returns to the railway department.

The following will show the totals of the railway department and of Mr. Hackett for the same period:

	Railway depart.	Mr. Hackett.
1842-3	£4,341,781	£4,530,501
1843-4	5,074,674	5,114,575
1844-5	6,209,714	6,065,956
1845-6	7,565,569	7,159,562
1846-7	8,510,886	8,194,767
1847-8		9,423,963

Except in the first two years, it will be seen that Mr. Hackett's totals are below those of the railway department, for the reason already given.

1844-5	£142,858
1845-6	406,007
1846-7	316,119

These figures show that any error in Mr. Hackett's figures must be on the safe side;—and if we take the difference for the year '47 and '48, at £300,000, this will give as the gross yearly traffic for the year ending 30th June last, £9,700,000, or nearly ten millions sterling.

The increase in passenger receipts in each year is as follows:

1844-5	£537,047
1845-6	748,874
1846-7	422,787

The increase in the number of passengers in each year, stands thus:

1844-5	6,027,651
1845-6	9,999,730
1846-7	7,561,180

The gross increase of revenue in each year stands thus:

1844-5	£1,135,040
1845-6	1,355,855
1846-7	945,317
1847-8	1,200,000

Mr. Hacket has shown (Herapath's Journal, 3d series, vol X, p. 33,) that the number of miles of railway on which his figures are taken, and the average traffic per mile are as follows:

	Miles.	Miles opened.	Traffic per m.
1842	1532	...	£3,036
1843	1586	59	3,081
1844	1780	194	3,283
1845	2043	263	3,500
1846	2610	503	3,288
1847	3449	839	2,862
1847-8 (Half-year.)	3830	381	2,719

The last line has been made up from other data.

The capital expended on railways has been likewise given by Mr. Hacket, from which we can learn the amount expended in each year.

1842	£52,380,100	whole capital,	expended.
1843	57,635,100	"	£5,255,000 "
1844	63,489,100	"	6,844,000 "
1845	71,646,100	"	8,157,000 "
1846	83,165,100	"	12,519,000 "
1847	109,528,800	"	26,363,700 "

The total amount of railway expenditure from 1842 to the end of 1847, was £57,548,700.

The total amount of railway income in those years has been—

1842	£4,341,781
1843	4,827,655
1844	5,584,983
1845	6,649,224
1846	7,664,874
1847	8,949,681
Add from railway returns.	865,984
Altogether	38,884,181

Of course the whole of this income cannot be treated as real capital, no more can the whole of the expenditure: but it is a significant fact, that while the whole expenditure has been £57,548,700, the whole income has been £38,884,181, or more than two thirds of that amount. This is deserving the attention of those who direct their attention towards the subject of railway capital.

It may be noted upon the decrease in the milage receipts, that it is to be accounted for from the greater economy in working expenses allowing of lower fares, and from the progress of railway improvement allowing lines to be more cheaply constructed. It will be found that the net return is not less in 1847 than 1842.

In 'Irish Wants and Practical Remedies,' by Humphrey Brown, Esq., M. P., p. 63, is given a table of the estimated passenger and goods traffic of several English lines, as given before the House of Commons. This I have extended as follows:

	Length in miles.	Passengers.	Goods. Tons.
Midland	163½	550,985	151,845
Lancashire and Yorkshire	79	207,688	109,486
York and North Midland	27½	185,660	5,547
London and Brighton	50	226,444	43,765
London and South Eastern	67	317,252	63,079
Great North of England	45	75,158	32,136
Great Western, and Bristol and Exeter	231	821,145	209,563
Lancaster and Preston	20	106,957	....
Glasgow and Ayr	18½	597,470	121,027
Hull and Selby	31	19,562	93,873
London and Cambridge	57½	591,344	72,314
Dundee and Arbroath	16½	200,727	51,899
Sheffield and Manchester	44½	335,444	84,050
Altogether	851½	4,135,836	1,038,504

The traffic realised on the above lines in 1845 was as follows:

	Passengers.	Goods traffic.
Midland	1,809,145	715,272
Lancashire and Yorkshire	1,674,946	507,859
York and North Midland	464,755	351,022
London and Brighton	788,386	65,747
London and South Eastern	728,896	87,119
Great North of England	196,722	234,198
Great Western and Bristol and Exeter	1,993,088	209,563
Lancaster and Preston	135,344	26,099
Glasgow and Ayr	843,078	168,376
Hull and Shelby	263,402	227,869
London and Cambridge*	534,206	44,572
Dundee and Arbroath	269,187	81,484
Sheffield and Manchester*	1,168,448	32,000
Altogether	10,868,503	2,751,180

* Partially opened.

The results are as follows:

Estimated traffic on 851 miles	4,135,836	1,038,504
Realised traffic, 1845	10,866,503	2,751,180
Excess over estimates	6,732,667	1,712,676
Increase per cent	160	170

In Mr. Brown's book, on a length of 702 miles the same increase of per centage is shown, viz: 160 per cent on passengers, and 170 on goods,

The whole traffic in 1845 was 33,791,253½ passengers, and of goods, etc., 11,600,000 tons. Supposing the proportions to be the same, the number of passengers carried in 1845 more than was provided with means of conveyance before the existence of railways, was 20,800,000, and the number of tons of goods conveyed was 7,200,000. Thus the railways not only accommodated the full number of passengers for whom conveyances already existed, but carried the above enormous number in addition, besides a great quantity of goods. It will be found that this calculation however is far from representing the amount of accommodation now afforded.

Taking the later returns, where they are available, we shall find the increase still greater, s in 1846, for instance:

	Passengers.	Goods. Tons.
Midland	2,468,110	900,895
Manchester and Lceds	2,157,173	523,177
York and North Midland, and Hull and Selby	933,514	370,414
London and Brighton	971,081	93,407
London and South Eastern	1,074,730	116,385
Great North of England	329,587	433,867
Great Western, etc	2,757,193	300,000
Lancaster and Preston	162,012	25,585
Glasgow and Ayr	1,091,371	293,304
London and Cambridge	922,413	110,348
Dundee and Arbroath	317,092	21,059
Sheffield and Manchester	1,604,227	135,000
	13,718,503	3,530,441

In 1847 there were separate returns from some of these lines, as the following:

	Passengers.	Goods. Tons.
Great Western, etc	2,876,222	371,326
Glasgow and Ayr	992,096	397,515
Lancaster and Preston	106,475	22,054
Dundee and Arbroath	360,194	22,354
Sheffield and Manchester	1,579,707	218,710
South Eastern	1,077,892	204,100

The increase over the estimates on the traffic of 1846 is still greater than on 1845.

	Passengers.	Goods. Tons.
Estimated traffic	4,135,836	1,038,504
Rralised traffic, 1846	13,718,503	3,530,441
Excess over estimates	9,572,667	2,492,937
Increase per cent	230	250

The traffic on these lines stands as follows:

	Passengers.	Goods. Tons.
Estimated	4,135,836	1,038,504
Realised, 1845	10,868,503	2,751,180
" 1846	14,078,697	3,530,441

The lines for which there are separate returns in 1847 are as follows:

Great Western	231 miles.
Glasgow and Ayr	18½ "
Lancaster and Preston	20 "
Dundee and Arbroath	16½ "
Sheffield & Manchester	44½ "
	297½ miles.

The traffic stands thus:

	Passengers.	Goods. Tons.
Estimated	2,378,995	529,618
Realised, 1845	5,138,041	604,641
" 1846	7,006,625	691,333
" 1847	7,382,586	1,236,081

The actual increase of traffic depends upon the length of time given for its developement, beginning at 160 per cent. and going up to 230 per cent., and in the case of the selected railways even more. Taking the increased accommodation to passengers at 160 per cent., this would give the following as the increased number of travellers provided with travelling accommodations in each year.

1844	17,400,000
1845	20,800,000
1846	27,000,000
1847	30,000,000

If the proportion be taken at 200 per cent, the number accommodated by railway, for whom no accommodation was before provided, would be 34,000,000.

The following shows the proportion of traffic on railways in each year for which accommodation by coach, etc., was provided, and for which no accommodation by coach, etc., was provided:

	Travellers from old coaches, etc.	New travellers.
1844	10,300,000	17,400,000
1845	12,900,000	20,800,000
1846	16,000,000	27,000,000
1847	21,000,000	30,000,000

Reckoning that each passenger is on the average carried 20 miles, each male adult in this country will be carried that distance six times in the year—an extent of accommodation which must have a great effect on trade and on the distribution of labor.

It appears from the averages given in the returns of the railway department, that there has been a still further reduction in fares on most of the lines, and an increase in the average speed per mile.

The total increase on each class of passengers is as follows:

	1845.	1846.	1847.
1st class	599,831	686,191	412,460
2d class	2,190,139	2,615,240	1,768,223
3d class	5,552,735	5,471,707	4,344,376
Altogether	6,028,651	9,999,730	7,561,180

It is to be observed that these figures cannot be absolutely relied upon, as the proportions of each class cannot be fully shown, on account of the confused state of the returns published by the railway department.

The total increase on each class of passengers between 1844 and 1847 has been as follows:

1st class	1,697,382
2d class	6,463,602
3d class	14,267,718
Altogether	23,588,561

This is probably more than the whole traffic of the country in 1825, and it shows at any rate that there has been a great increase in the accommodation given to the working classes.

The number of first, second and third class passengers in 1847 on the leading lines was,

	1st.	2d.	3d.
London and N. West.	1,112,970	3,323,380	2,163,285
South Eastern	657,380	1,493,142	2,008,230
Midland	445,260	1,260,312	2,571,826
London and Blackwall	858,201	2,279,166	.....
Lancashire & York'rs	916,791	581,790	2,090,624
Great Western	459,734	1,996,824	419,663
London and Brighton	425,948	699,898	1,489,985
Dublin and Kings'n.	154,889	1,269,092	814,969
Eastern Counties	287,526	741,846	1,044,168
South Western	399,776	1,095,050	472,482
Manch. and Sheffield	82,201	151,606	1,336,900
York and Newcastle	152,083	753,927	643,203
York and N. Midland	163,837	309,782	731,207
Newcastle and Berw.	67,734	174,890	944,891
Edinb'g and Glasgow	105,373	206,485	836,025

On the London and North Western, Great Western, South Western and York and Newcastle, the proportion of third class passengers is much below the regular proportion.

The largest receipts from passengers in 1844 are—

London and North Western	£1,173,798
Great Western	674,241
Midland	567,126
South Eastern	335,764
Brighton	314,493
Eastern Counties	296,393
South Western	286,373
Lancashire and Yorkshire	184,762
York and North Midland	165,434
York and Newcastle	147,252
Edinburg and Glasgow	112,582

The largest amounts received for 1st class passengers are—

London and North Western	£513,795
Great Western	232,854
Midland	178,434
Brighton	124,220
South Eastern	117,659
South Western	97,689
Eastern Counties	93,304

The largest amounts received for 3d class passengers are—

London and North Western	£209,890
Midland	153,354
Lancashire and Yorkshire	90,282
South Eastern	85,403
Great Western	77,129
Eastern Counties	74,234
York and North Midland	65,507

To be Continued.

TO CONTRACTORS.

SEALED proposals will be received at the office of the Lafayette and Indianapolis Railroad Co. in Lafayette, until the 11th day of October next, for the Grading, Masonry and Bridging of that part of said road lying between the summit south of Durkee's Run, near Lafayette, and Lebanon, in Boone county, about 34 miles. Also, for the wooden superstructure for the same, in a distinct bid.

Plans and specifications will be exhibited by the engineer. By order of the Board.

ALBERT S. WHITE, Pres't.

Lafayette, Aug. 17, 1848. 6t35

TO MACHINISTS & MANUFACTURERS. The Subscribers have taken the READING CAR AXLE MANUFACTORY—and are prepared to execute orders for *Axles of every description*, and Wrought Iron Shafts for Steamboats, Mills, etc., made from superior material, at short notice. Address *Reading, Pa.*

ANDREW TAYLOR & CO.

August 5, 1848—3m*

DEAN, PACKARD & MILLS,

MANUFACTURERS OF ALL KINDS OF

RAILROAD CARS,

SUCH AS

PASSENGER, FREIGHT AND CRANK CARS,

— ALSO —

SNOW PLOUGHS AND ENGINE TENDERS OF VARIOUS KINDS.

CAR WHEELS and AXLES fitted and furnished at short notice; also, STEEL SPRINGS of various kinds; and

SHAFTING FOR FACTORIES.

☞ *The above may be had at order at our Car Factory,*

REUEL DEAN, ELIJAH PACKARD, ISAAC MILLS, } SPRINGFIELD, MASS.

1y48

RAILROAD SCALES.—THE ATTENTION of Railroad Companies is particularly requested to Ellicotts' Scales, made for weighing loaded cars in trains, or singly, they have been the inventors, and the first to make platform scales in the United States; supposing that an experience of 20 years has given a knowledge and superior advantage in the business.

The levers of our scales are made of wrought iron, all the bearers and fulcrums are made of the best cast steel, laid on blocks of granite, extending across the pit, the upper part of the scale only being made of wood. E. Ellicott has made the largest Railroad Scale in the world, its extreme length was one hundred and twenty feet, capable of weighing ten loaded cars at a single draft. It was put on the Mine Hill and Schuylkill Haven Railroad.

We are prepared to make scales of any size to weigh from five pounds to two hundred tons.

ELLICOTT & ABBOTT.

Factory, 9th street, near Coates, cor. Melon st.
Office, No. 3 North 5th street,
y25 Philadelphia, Pa.

TO RAILROAD COMPANIES AND MANufacturers of railroad Machinery. The subscribers have for sale Am. and English bar iron, of al. sizes; English blister, cast, shear and spring steel; Juniata rods; car axles, made of double refined iron; sheet and boiler iron, cut to pattern; tiers for locomotive engines, and other railroad carriage wheels, made from common and double refined B. O. iron; the latter a very superior article. The tires are made by Messrs. Baldwin & Whitney, locomotive engine manufacturers of this city. Orders addressed to them, or to us, will be promptly executed.

When the exact diameter of the wheel is stated in the order, a fit to those wheels is guaranteed, saving to the purchaser the expense of turning them out inside.

THOMAS & EDMUND GEORGE,

a45 N. E. cor. 12th and Market sts., Philad., Pa.

THE NEWCASTLE MANUFACTURING Company continue to furnish at the Works, situated in the town of Newcastle, Del., Locomotive and other steam engines, Jack screws, Wrought iron work and Brass and Iron castings, of all kinds connected with Steamboats, Railroads, etc.; Mill Gearing of every description; Cast wheels (chilled) of any pattern and size, with Axles fitted, also with wrought tires, Springs, Boxes and bolts for Cars; Driving and other wheels for Locomotives.

The works being on an extensive scale, all orders will be executed with promptness and despatch. Communications addressed to Mr. William H. Dobbs, Superintendent, will meet with immediate attention.

ANDREW C. GRAY,

a45 President of the Newcastle Manuf. Co.

LAP—WELDED
WROUGHT IRON TUBES
FOR
TUBULAR BOILERS,
FROM 1 1-2 TO 8 INCHES DIAMETER.

These Tubes are of the same quality and manufacture as those so extensively used in England, Scotland, France and Germany, for Locomotive, Marine and other Steam Engine Boilers.

THOMAS PROSSER,
Patentee.
98 Platt street, New York.

ENGINEERS' AND SURVEYERS'
INSTRUMENTS MADE BY
EDMUND DRAPER,
Surviving partner of
STANCLIFFE & DRAPER.

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DIRECT ACTION ENGINES FOR STEAMBOATS.

THE PATENT DOUBLE CYLINDERS,
AND ALSO
THE ANNULAR RING PISTON ENGINES,

of Messrs. Mauldslay, Sons & Field, of London, may be built in the United States, under license, which can be obtained of their agent,

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28 Platt street, New York.

May 6, 1848.

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The subscribers have on hand, and are constantly receiving, from their manufactory,

PARK WORKS, SHEFFIELD,

Double Refined Cast Steel—Square, flat & octagon.
Best warranted Cast Steel—Square, flat & octagon.
Best Double and Single Shear Steel—Warranted.
Machinery Steel—Round.
Best and 2d gy. Sheet Steel—for Saws and other purposes.
German Steel—flat and sqr., "W. I. & S." "Eagle" and "Goat" Stamps.
Genuine "Sykes," L Blister Steel.
Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms, by WM. JESSOP & SONS,
91 John Street, New York.

Also by their Agents—
Curtus & Hand, 47 Commerce St., Philadelphia.
Alex'r Fullerton, & Co., 119 Milk St., Boston.
Stickney & Beatty, South Charles St., Baltimore.

May 6, 1848.

NEW PATENT CAR WHEELS.

THE SUBSCRIBERS ARE NOW MANUfacturing Metallic Plate Wheels of their invention, which are pronounced by those that have used them, a superior article, and the demand for them has met the most sanguine expectations of the inventors. Being made of a superior quality of Charcoal Iron, they are warranted equal to any manufacture.

We would refer Railroad Companies and others to the following roads that have them in use. Hartford and New Haven, Connecticut River Railroad, Housatonic, Harlem, Farmington, and Stonington.

SIZER & CO.
January 29, 1848. tf Springfield, Mass.

INDIA RUBBER RAILROAD SPRINGS.

These springs are now generally acknowledged to be far superior to steel. They are very much lighter—their power is more easily regulated—they are more elastic, and yet possess great strength, and they always retain their elasticity, and are not affected by extremes of cold or heat. The very easy motion which a Car possesses when fitted with these springs is at once perceptable. They are equally applicable to Engines and Tenders.

Railroad and other companies are requested to notice that the Patent for these springs was granted to *W. C. Fuller* by the United States Government, and that any parties vending or using such springs, without his license, infringe upon his Patent, and will be proceeded against for so doing.

G. M. KNEVITT, Agent for the Patentee,
78 Broad St., New York.

July 15, 1848.

TO RAILROAD CONTRACTORS. NASHVILLE AND CHATTANOOGA Railroad. On the 1st of August next Proposals will be received at the Railroad Office in Nashville, for the Graduation and Masonry of Forty Miles of the Nashville and Chattanooga Railroad, comprising a large am't of rock excavation, and *One Tunnel of Seven Hundred Yards in Length.*

CHARLES F. M. GARNETT,
5t27 Chief Engineer.

RAILROAD IRON AND LOCOMOTIVE Tyres imported to order and constantly on hand by A. & G. RALSTON
Mar. 20tf 4 South Front St., Philadelp'a.

MATTEWAN MACHINE WORKS.

THE MATTEWAN COMPANY HAVE added to their Machine Works, an extensive LOCOMOTIVE ENGINE department, and are prepared to execute orders for *Locomotive Engines* of every size and pattern—also, *Tenders, Wheels, Axles,* and other Railroad Machinery, to which they ask the attention of those who wish such articles, before they purchase elsewhere.

STATIONARY ENGINES, BOILERS, ETC., Of any required size or pattern, arranged for driving *Cotton, Woollen,* or *other* Mills, can be had on favorable terms, and at short notice.

COTTON AND WOOLLEN MACHINERY, Of every description, embodying all the modern improvements, second in quality to none in this or any other country, made to order.

MILL GEARING,

Of every description, may be had at short notice, as this company has probably the most extensive assortment of patterns in this line, in any section of the country, and are constantly adding to them.

TOOLS.

Turning Lathes, Slabbing, Planing, Cutting, and *Drilling* Machines, of the most approved patterns, together with all other tools required in machine shops, may be had at the Mattewan Company's Shops, Fishkill Landing, or at

39 Pine Street, New York.
WM. B. LEONARD, *Agent.*

FAIRBANKS' RAILROAD SCALES.

THE Subscribers are prepared to construct at short notice, *Railroad* and *Depot Scales,* of any desired length and capacity. Their long experience as manufacturers—their improvements in the construction of the various modifications, having reference to strength, durability, retention of adjustment, accurracy of weight and despatch in weighing—and the long and severe tests to which their scales have been subjected—combine to ensure for these scales the universal confidence of the public.

No other scales are so extensively used upon Railroads, either in the United States or Great Britain; and the manufacturers refer with confidence to the following in the United States.

Eastern Railroad,	Boston and Maine R. R.,
Providence Railroad,	Providence & Wor. R.R.,
Western Railroad,	Concord R. R.,
Old Colony Railroad,	Fitchburg R. R.,
Schenectady Railroad,	Syracuse and Utica R. R.,
Baltimore & Ohio Road,	Baltimore & Susq. R. R.,
Phila. & Reading Road.	Schuylkill Valley R. R.,
Central (Ga.) Railroad.	Macon and Western R.R.,
New York and Erie Railroad;	

and other principal Railroads in the Western, Middle and Southern States.

E. & F. FAIRBANKS & CO.
St. Johnsbury, Vt.

Agents { FAIRBANKS & Co., 81 Water st. N. York.
{ A. B. NORRIS, 196 Market st., Philad.

April 22, 1848. 1y*17

PATENT HAMMERED RAILROAD, SHIP and Boat Spikes. The Albany Iron and Nail Works have always on hand, of their own manufacture, a large assortment of Railroad, Ship and Boat Spikes, from 2 to 12 inches in length, and of any form of head. From the excellence of the material always used in their manufacture, and their very general use for railroads and other purposes in this country, the manufacturers have no hesitation in warranting them fully equal to the best spikes in market, both as to quality and appearance. All orders addressed to the subscriber at the works, will be promptly executed. JOHN F. WINSLOW, *Agent.*

Albany Iron and Nail Works, Troy, N. Y.

The above spikes may be had at factory prices, of Erastus Corning & Co., Albany; Hart & Merritt, New York; J. H. Whitney, do.; E. J. Etting, Philadelphia; Wm. E. Coffin & Co., Boston. ja45

THE SUBSCRIBERS ARE PREPARED TO execute orders at their Phœnix Works for Railroad Iron of any required pattern, equal in quality and finish to the best imported.

REEVES, BUCK & CO.,
Philadelphia.
ROBERT NICHOLS, Agent,
y6tf No. 79 Water St., New York.

CHILLED RAILROAD WHEELS.—THE undersigned are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of Spokes or Disks, by a new process which prevents all strain on the metal, such as is is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St. below 13th,
Nov. 10, 1847. [tf.] Philadelphia, Penna.

THE SUBSCRIber has on hand a good assortment of his best Leveling and Surveying Instruments, among them his improved Compass for taking angles without the needle—also Bells, suitable for Churches, Railroad Depots, etc. ANDREW MENEELY.
West Troy, May 12, 1847. 1y*21

PATENT RAILROAD, SHIP AND BOAT Spikes. The Troy Iron and Nail Factory keeps constantly for sale a very extensive assortment of Wrought Spikes and Nails, from 3 to 10 inches, manufactured by the subscriber's Patent Machinery, which after five years' successful operation, and now almost universal use in the United States (as well as England, where the subscriber obtained a patent) are found superior to any ever offered in market.

Railroad companies may be supplied with Spikes having countersink heads suitable to holes in iron rails, to any amount and on short notice. Almost all the railroads now in progress in the United States are fastened with Spikes made at the above named factory—for which purpose they are found invaluable, as their adhesion is more than double any common spikes made by the hammer.

All orders directed to the Agent, Troy, N. York will be punctually attended to.

HENRY BURDEN, *Agent*

Spikes are kept for sale, at Factory Prices, by & J. Townsend, Albany, and the principal Iron merchants in Albany and Troy; J. I. Brower, 222 Water St., New York; A. M. Jones, Philadelphia; T. Jarviers, Baltimore; Degrand & Smith, Boston.

*** Railroad Companies would do well to forward their orders as early as practicable, as the subscriber is desirous of extending the manufcturing so as to keep pace with the daily increasing demand.

ja45

TO LOCOMOTIVE AND MARINE ENgine Boiler Builders. Pascal Iron Works, Philadelphia. Welded Wrought Iron Flues, suitable for Locomotives, Marine and other Steam Engine Boilers, from 2 to 5 inches in diameter. Also, Pipes for Gas, Steam and other purposes; extra strong Tube for Hydraulic Presses; Hollow Pistons for Pumps of Steam Engines, etc. Manufactured and for sale by

MORRIS TASKER & MORRIS,
Warehouse S. E. corner 3d and Walnut Sts., Philadelphia. 1tf

CHILLED RAILROAD WHEELS.—THE undersigned, the *Original Inventor* of the *Plate Wheel* with solid hub, is prepared to execute all orders for the same, promptly and faithfully, and solicits a share of the patronage for those kind of wheels which are now so much preferred, and which he originally produced after a large expenditure of time and money. A. TIERS,

Point Pleasant Foundry,

He also offers to furnish Rolling Mill Castings, and other Mill Gearing, with promptness, having, he believes, the largest stock of such patterns to be found in the country. A. T.

Kensington, Philadelphia Co., }
March 12, 1848. } 11tf

NORWICH CAR FACTORY,
NORWICH, CONNECTICUT.

AT the head of navigation on the River *Thames*, and on the line of the *Norwich and Worcester Railroad*, established for the manufactory of

RAILROAD CARS,

OF EVERY DESCRIPTION, VIZ:

PASSENGER, FREIGHT AND HAND CARS,

ALSO, VARIOUS KINDS OF

ENGINE TENDERS AND SNOW PLOUGHS.

TRUCKS, WHEELS & AXLES

Furnished and fitted at short notice.

Orders executed with promptness and despatch.

☞ Any communication addressed to

JAMES D. MOWRY,
General Agent,
Norwich, Conn.,

Will meet with immediate attention. 1y8

MANUFACTURE OF PATENT WIRE Rope and Cables for Inclined Planes, Standing Ship Rigging, Mines, Cranes, Tillers etc., by JOHN A. ROEBLING, *Civil Engineer*, Pittsburgh, Pa.

These Ropes are in successful operation on the planes of the Portage Railroad in Pennsylvania, on the Public Slips, on Ferries and in Mines. The first rope put upon Plane No. 3, Portage Railrord, has now run 4 seasons, and is still in good condition. 92v1 1y

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NICOLL'S PATENT SAFETY SWITCH for Railroad Turnouts. This invention, for some time in successful operation on one of the principal railroads in the country, effectually prevents engines and their trains from running off the track at a switch, left wrong by accident or design.

It acts independently of the main track rails, being laid down, or removed, without cutting or displacing them.

It is never touched by passing trains, except when in use, preventing their running off the track. It is simple in its construction and operation, requiring only two Castings and two Rails; the latter, even if much worn or used, not objectionable.

Working Models of the Safety Switch may be seen at Messrs. Davenport and Bridges, Cambridgeport, Mass., and at the office of the Railroad Journal, New York.

Plans, Specifications, and all information obtained on application to the Subscriber, Inventor, and Patentee G. A. NICOLLS,
ja45 *Reading, Pa.*

TO RAILROAD COMPANIES AND BUILDERS OF MARINE AND LOCOMOTIVE ENGINES AND BOILERS.

PASCAL IRON WORKS.

WELDED WROUGHT IRON TUBES

From 4 inches to ¼ in calibre and 2 to 12 feet long, capable of sustaining pressure from 400 to 2500 lbs. per square inch, with Stop Cocks, T's, L's, and other fixtures to suit, fitting together, with screw joints, suitable for STEAM, WATER, GAS, and for LOCOMOTIVE and other STEAM BOILER Flues.

Manufactured and for sale by
MORRIS, TASKER & MORRIS.
Warehouse S. E. Corner of Third & Walnut Streets,
PHILADELPHIA.

LAWRENCE'S ROSENDALE HYDRAULIC Cement. This cement is warranted equal to any manufactured in this country, and has been pronounced superior to Francis' "Roman." Its value for Aqueducts, Locks, Bridges, Flooms and all Masonry exposed to dampness, is well known, as it sets immediately under water, and increases in solidity for years.

For sale in lots to suit purchasers, in tight papered barrels, by JOHN W. LAWRENCE,
142 Front street, New York.

☞ Orders for the above will be received and promptly attended to at this office. 32 1y

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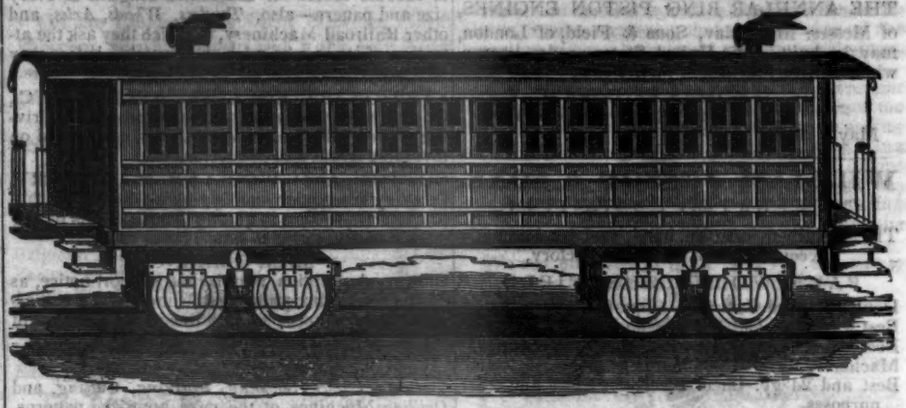
DAVENPORT & BRIDGES'
CAR WORKS, CAMBRIDGEPORT, MASS.



Manufacture to Order, Passenger and Freight Cars of every description, and of the most improved pattern; also furnish Snow Ploughs and Chilled Wheels of any pattern and size. Forged Axles, Springs, Boxes and Bolts for Cars at the lowest prices.

All orders punctually executed and forwarded to any part of the country.

Our Works are within fifteen minutes ride from State street, Boston—Omnibuses pass every fifteen minutes. 10*tf*

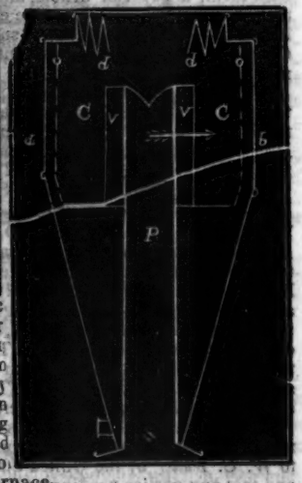
THE SUBSCRIBER IS PREPARED TO execute at the Trenton Iron Works, orders for Railroad Iron of any required pattern, and warranted equal in every respect in point of quality to the best American or imported Rails. Also on hand and made to order, Bar Iron, Braziers' and Wire Rods, etc., etc. PETER COOPER,
ty10 17 Burling Slip, New York

RAILROAD IRON, PIG IRON, ETC.

600 Tons of T Rail 60 lbs. per yard.
25 Tons of 2½ by ½ Flat Bars.
25 Tons of 2½ by 9-16 Flat Bars.
100 Tons No. 1 Gartshrorie.
100 Tons Welsh Forge Pigs.

For Sale by A. & G. RALSTON & CO.
No. 4 So. Front St., *Philadelphia*

FRENCH AND BAIRD'S PATENT SPARK ARRESTER.



TO THOSE INTERESTED IN Railroads, Railroad Directors and Managers are respectfully invited to examine an improved Spark Arrester recently patented by the undersigned.

Our improved Spark Arresters have been extensively used during the last year on both passenger & freight engines, and have been brought to such a state of perfection that no annoyance from sparks or dust from the chimney of engines on which they are used is experienced.

These Arresters are constructed on an entirely different principle from any heretofore offered to the public The form is such that a rotary motion is imparted to the heated air smoke and sparks passing through the chimney, and by the centrifugal force thus acquired by the sparks and dust they are separated from the smoke and steam, and thrown into an outer chamber of the chimney through openings near its top, from whence they fall by their own gravity to the bottom of this chamber; the smoke and steam passing off at the top of the chimney, through a capacious and unobstructed passage, thus arresting the sparks without impairing the power of the engine by diminishing the draught or activity of the fire in the furnace.

These chimneys and arresters are simple, durable and neat in appearance. They are now in use on the following roads, to the managers and other officers of which we are at liberty to refer those who may desire to purchase or obtain further information in regard to their merits

R. L. Stevens, President Camden and Amboy Railroad Company; Richard Peters, Superintendant Georgia Railroad, Augusta, Ga.; G. A. Nicolls, Superintendant Philadelphia, Reading and Pottsville Railroad, Reading, Pa.; W. E. Morris, President Philadelphia, Germantown and Norristown Railroad Company, Philadelphia; E. B. Dudley, President W. and R. Railroad Company, Wilmington, N. C.; Col. James Gadsden, President S. C. and C. Railroad Company, Charleston, S. C.; W. C. Walker, Agent Vicksburgh and Jackson Railroad, Vicksburgh, Miss.; R. S. Van Rensselaer, Engineer and Sup't Hartford and New Haven Railroad; W. R. M'Kee, Sup't Lexington and Ohio Railroad, Lexington, Ky.; T. L. Smith, Sup't New Jersey Railroad Trans. Co.; J. Elliott, Sup't Motive Power Philadelphia and Wilmington Railroad, Wilmington, Del.; J. O. Sterns, Sup't Elizabethtown and Somerville Railroad; R. R. Cuyler, President Central Railroad Company, Savannah, Ga.; J. D. Gray, Sup't Macon Railroad, Macon, Ga.; J. H. Cleveland, Sup't Southern Railroad, Monroe, Mich.; M. F. Chittenden, Sup't M. P. Central Railroad, Detroit, Mich; G. B. Fisk, President Long Island Railroad, Brooklyn.

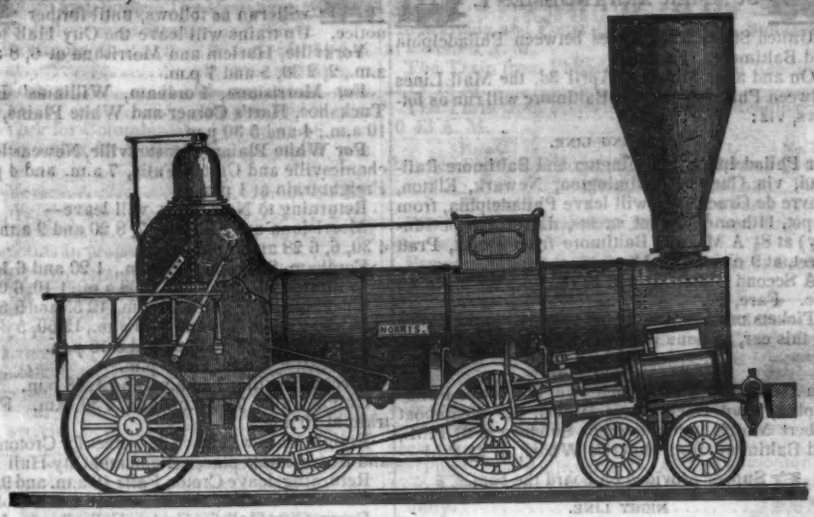
Orders for these Chimneys and Arresters, addressed to the subscribers, care Messrs. Baldwin & Whitney, of this city, will be promptly executed. FRENCH & BAIRD.

N. B.—The subscribers will dispose of single rights, or rights for one or more States, on reasonable terms. *Philadelphia, Pa., April 6, 1844.*

*** The letters in the figures refer to the article given in the *Journal* of June, 1844. ja45

NORRIS' LOCOMOTIVE WORKS.

BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,



THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS' BROTHERS.

MACHINE WORKS OF ROGERS, Ketchum & Grosvenor, Patterson, N. J. The undersigned receive orders for the following articles, manufactured by them of the most superior description in every particular. Their works being extensive and the number of hands employed beinglarge, they are enabled to execute both large and small orders with promptness and despatch.

Railroad Work.

Locomotive steam engines and tenders; Driving and other locomotive wheels, axles, springs & flange tires; car wheels of cast iron, from a variety of patterns, and chills; car wheels of cast iron with wrought tires; axles of best American refined iron; springs; boxes and bolts for cars.

Cotton, Wool and Flax Machinery of all descriptions and of the most improved patterns, style and workmanship.

Mill gearing and Millwright work generally; hydraulic and other presses; press screws; callenders; lathes and tools of all kinds; iron and brass castings of all descriptions.

ROGERS, KETCHUM & GROSVENOR,
Paterson, N. J., or 60 Wall street, N. York.

PIG AND BLOOM IRON.—THE SUBSCRIbers are agents for the sale of numerous brands of Charcoal and Anthracite Pig Iron, suitable for Machinery, Railroad Wheels, Chains, Hollowware, etc. Also several brands of the best Puddling Iron, Juniatta Blooms suitable for Wire, Boiler Plate, Axe Iron, Shovels, etc. The attention of those engaged in the manufacture of Iron is solicited by

A. WRIGHT & NEPHEW,
12tf Vine St. Wharf, Philadelphia.

T. & C. WASON, Manufacturers of every style of Freight and Baggage Cars.—Forty rods east of the depot, Springfield, Mass.

Running parts in sets complete, Wheels, Axles, or any part of cars furnished and fitted up at short notice and in the best manner.

N. B. Particular attention paid to the manufacture of the *most improved* Freight Cars. We refer to the New Haven, Hartford and Springfield; Connecticut River; Harlem; Housatonic, and Western, Mass., Railroads, where our cars are now in constant use.

Dec. 25, 1847.—1y.

SPRING STEEL FOR LOCOMOTIVES, Tenders and Cars. The Subscriber is engaged in manufacturing Spring Steel from 1¼ to 6 inches in width, and of any thickness required: large quantities are yearly furnished for railroad purposes, and wherever used, its quality has been approved of. The establishment being large, can execute orders with great promptitude, at reasonable prices, and the quality warranted. Address

JOAN F. WINSLOW, *Agent*,
1y Albany Iron and Nail Works,

IMPORTANT TO ENGINEERS, CONtractors, and Surveyors.—The Engineer's, Contractor's and Surveyor's Pocket Table Book, by J. M. Scribner, A. M., 264 pages, 24 mo; tuck binding, with gilt edge. Published by Huntington & Savage, 216 Pearl street, New York.

The above work comprises Logarithms of Numbers, Logarithmic Sines and Tangents, Natural Sines and Natural Tangents; the Traverse Table, and a full and extensive set of tables, *exhibiting at one view the number of cubic yards contained in any embankment or cutting, and for any base or slope of sides usual in practice.* Besides these essential tables, the work comprises 50 pages more of Mensuration, Tables, Weights of Iron, Strength of Materials, Formulas, Diagrams, etc., for laying out railroads, canals and curves; much of which has never before been offered to the public, and all dispensable to the engineer. This book will prove a great saving of time, and will enable the new beginner to furnish results as accurately (and with much greater rapidity) as the most experienced in the profession without its aid. The tables of Logarithms, etc., have been carefully corrected and compared with *different* editions of the same tables; and *all* the tables throughout the book have been read carefully by proofs four times; hence the most implicit confidence may be placed in their correctness.

Also, *Scribner's Engineer's and Mechanic's Companion*, new edition, 264 pages, enlarged, with 35 pages of entirely new matter, and much improved throughout.

It is believed these books are so well adapted to suit the above professions, that they cannot *afford* to do without them, and that they will aid in rewarding well directed mental labor.

Both are for sale by all the principal booksellers throughout the United States and Canada.

WESTERN RAILROAD.—ON AND AFter Monday, April 5, 1847, the passenger trains will leave daily, Sundays excepted, as follows:

Boston at 8 a. m. and 4 p. m. for Albany.

Albany at 7 1-4 a. m. and 5 p. m. for Boston.

Springfield at 8 1-2 a. m. and 1 p. m. for Albany.

Springfield at 8 1-2 a. m. and 1 1-2 and 3 p. m. (or on arrival of the train from New York) for Boston.

Day line to New York, via Springfield.—The steamboat train leaves Boston at 6 a. m., and arrives in New York at 7 p. m., by the steamboats Traveller, New York, or Champion. Returning, leaves New York at 6 1-4 a. m., and arrives in Boston at 7 p. m.

Night line to New York.—Leaves Boston at m., and arrives in New York at 5 a. m.

Albany and Troy.—Leave Boston at 8 a. m., Springfield at 1 p. m., and arrive in Albany at 6 p. m.; or, leave Boston at 4 p.m., Springfield next morning at 8 1-2, and arrive in Albany at 1 1-2 p.m.

The Troy trains connect at Greenbush.

The trains for Buffalo leave at 7½ a.m. and 7 p.m.

For Northampton, Greenfield, etc.—The trains of the Connecticut River Railroad leave Springfield at 8 1-4 a.m., 1 and 3 p.m., and passengers proceed directly on to Brattleboro', Windsor, Bellows Falls, Walpole, Hanover, Haverhill, etc.

For Hartford.—The trains leave Springfield on the arrival of the trains from Boston.

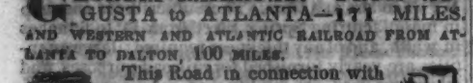
The trains of Pittsfield and North Adams Railroad leave Pittsfield on the arrival of the trains from Boston.

N. B.—No responsibility assumed for any baggage by the passenger trains, except for wearing apparel not exceeding the value of fifty dollars, unless by special agreement.

JAMES BARNES, Sup't and Eng'r,
C. A. SEAD, Agent, 27 State street, Boston.

GEORGIA RAILROAD. FROM AUGUSTA to ATLANTA—171 MILES.

AND WESTERN AND ATLANTIC RAILROAD FROM ATLANTA TO DALTON, 100 MILES.



This Road in connection with the South Carolina Railroad and Western and Atlantic Railroad now forms a continuous line, 408 miles in length, from Charleston to Dalton (Cross Plains) in Murray county, Ga.—33 miles from Chattanooga, Tenn.

RATES OF FREIGHT.		Between Augusta and Dalton.	Between Charleston and Dalton.
		271 miles.	408 miles.
1st class.	Boxes of Hats, Bonnets, and Furnature, per cubic foot	$0 18	$0 28
2d class.	Boxes and Bales of Dry Goods, Sadlery, Glass, Paints, Drugs and Confectionary, per 100 lbs.	1 00	1 50
3d class.	Sugar, Coffee, Liquor, Bagging, Rope, Cotton Yarns, Tobacco, Leather, Hides, Copper, Tin, Feathers, Sheet Iron, Hollow Ware, Castings, Crockery, etc.	0 60	0 85
4th class.	Flour, Rice, Bacon, Pork, Beef, Fish, Lard, Tallow, Beeswax, Bar Iron, Ginseng, Mill Gearing, Pig Iron, and Grindstones, etc	0 40	0 65
	Cotton, per 100 lbs	0 45	0 70
	Molasses, per hogshead	8 50	13 50
	" " barrel	2 50	4 25
	Salt per bushel	0 18	
	Salt per Liverpool sack	0 65	
	Ploughs, Corn Shellers, Cultivators, Straw Cutters, Wheelbarrows	0 75	1 50

German or other emigrants, in lots of 20 or more, will be carried over the above roads at 2 cents per mile.

Goods consigned to S. C. Railroad Co. will be forwarded free of commissions. Freight payable at Dalton.

F. C. ARMS,
Sup't. of Transportation.

Augusta, Ga., July 15, 1847. 44-1y

THE WESTERN AND ATLANTIC

Railroad.—This Road is now in operation to Oothcaloga, a distance of 80 miles, and connects daily (Sundays excepted) with the Georgia Rail road.

From Kingston, on this road, there is a tri-weekly line of stages, which leave on the arrival of the cars on Tuesday, Thursday and Saturday, for Warrenton, Huntsville, Decatur and Tuscumbia, Alabama, and Memphis, Tennessee.

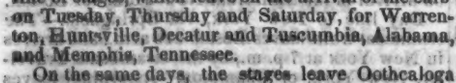
On the same days, the stages leave Oothcaloga for Chattanooga, Jasper, Murfreesborough, Knoxville and Nashville, Tennessee.

This is the most expeditious route from the east to any of these places.

CHAS. F. M. GARNETT,
Chief Engineer.

Atlanta, Georgia, April 16th, 1846 1y1

CENTRAL RAILROAD—FROM SAVANNAH to Macon. Distance 190 miles.



This Road is open for the transportation of Passengers and Freight. Rates of Passage, $8 00. Freight—

On weight goods generally	50 cts. per hundred.
On measurement goods	13 cts. per cubic ft.
On brls. wet (except molasses and oil)	$1 50 per barrel.
On brls. dry (except lime)	80 cts. per barrel.
On iron in pigs or bars, castings for mills, and unboxed machinery	40 cts. per hundred
On hhds. and pipes of liquor, not over 120 gallons	$5 00 per hhd.
On molasses and oil	$6 00 per hhd.

Goods addressed to F. WITTER, Agent, forwarded free of commission. THOMAS PURSE,
y40 Gen'l. Sup't. Transportation.

PHILADELPHIA, WILMINGTON & BALTIMORE RAILROAD.—1848.

SUMMER ARRANGEMENT.

United States Mail Lines between Philadelphia and Baltimore. Fare, $3.

On and after Monday, April 3d, the Mail Lines between Philadelphia and Baltimore will run as follows, viz:

MORNING LINE.

Per Philadelphia, Wilmington and Baltimore Railroad, via Chester, Wilmington, Newark, Elkton, Havre de Grace, etc., will leave Philadelphia, from Depot, 11th and Market streets, daily (except Sunday) at 8½ A.M., and Baltimore from Depot, Pratt street, at 9 o'clock, A.M.

A Second Class Car will be run with the morning line. Fare, $2.

Tickets must positively be procured at the Office for this car, as none will be sold by the conductors.

AFTERNOON LINE.

Via Newcastle and Frenchtown, will leave Philadelphia, from Dock Street Wharf, per Steamboat Robert Morris, daily (except Sunday) at 2½ P.M., and Baltimore, from Bowly's Wharf, at 2½ P.M.—

☞ Supper provided on board the boat. ☜

NIGHT LINE.

Per Philadelphia, Wilmington and Baltimore Railroad, will leave Philadelphia, from depot, 11th and Market streets, daily, at 11 P.M., and Baltimore at 8 P.M.

WHEELING AND PITTSBURG.

Tickets through to Wheeling or Pittsburg, can be procured at the depot, or on board of the steamboat. Fare to Wheeling, $13. Fare to Pittsburg, $12.

The trains leave Baltimore for the west at 7 A.M. and 4 P.M.

SUNDAY MAIL LINE.

The only line for Baltimore on Sunday leaves the depot, 11th and Market streets, at 10 P.M.

Passengers for these lines must procure their Tickets at the office before taking their seats in the cars.

NOTICE.—All Baggage by these lines is at its owner's risk, and passengers are expressly prohibited taking anything as baggage, except their wearing apparel. 50 lbs. baggage allowed each passenger.

WILMINGTON ACCOMMODATION TRAINS.

On and after Monday, April 3d, the Accommodation Trains, stopping at all the intermndiate places between Philadelphia and Wilmington, will leave as follows, viz:

Leave Philadelphia, from depot 11th and Market streets, daily (Sundays excepted) at 1½ and 4 P. M.

Leave Wilmington, from the depot, Water street, daily (except Sunday) at 7½ A.M. and 4½ P.M.

The Freight Accommodation Train will leave Philadelphia at 7 P.M. and Wilmington at 7 P.M.

The Mail Trains stopping at Chester and Wilminton, leave Philadelphia at 8½ A.M. and 10 P.M. Wilmington at 1 o'clock, P.M., and 12 midnight.

Fare to Wilmington, 50 cts. Fare to Chester, 25 cts.

G. H. HUDDELL, *Agent.*

March 23, 1848. 1y15

☞ NOTICE. ☜

RAILROAD LINE BETWEEN ALBANY AND BUFFALO, N. Y.

1848.—SCHEDULE FOR RUNNING.—1848.

Going west.	1st train.	2d train.	3d train
Leaves....Albany	7½ A.M.	2 P.M.	7 P.M.
Pass.....Utica	1 P.M.	7½ P.M.	1½ A.M.
Pass.....Syracuse	4½ P.M.	11 P.M.	5 A.M.
Pass.....Auburn	6½ P.M.	1 A.M.	7 A.M.
Pass.....Rochester	12½ M.N.	7 A.M.	1 P.M.
Arrives at Buffalo	5½ A.M.	12 M.	6 P.M.
Going east.	**1st train.**	**2d train.**	**3d train.**
Leaves....Buffalo	7½ A.M.	2 P.M.	7 P.M.
Pass.....Rochester	12½ M.	7 P.M.	12 M.N.
Pass.....Auburn	6½ P.M.	1 A.M.	6 A.M.
Pass.....Syracuse	8½ P.M.	3½ A.M.	8 A.M.
Pass.....Utica	12 M.N.	7 A.M.	11½ A.M.
Arrives at Albany	5 A.M.	12 M.	4½ P.M.

Adopted February 18, 1848, in convention at Albany. (Copy.) T. Y. HOWE, Jr.,
Secretary of the Convention.

NEW YORK & HARLEM RAILROAD CO.—Summer Arrangement.—On and after

Tuesday, June 1st, 1847, the cars will run as follows, until further notice. Up trains will leave the City Hall for—

Yorkville, Harlem and Morrisana at 6, 8 and 11 a.m., 2, 2 30, 5 and 7 p.m.

For Morrisiana, Fordham, Williams' Bridge, Tuckahoe, Hart's Corner and White Plains, 7 and 10 a.m., 4 and 5 30 p.m.

For White Plains, Pleasantville, Newcastle, Mechanicsville and Croton Falls, 7 a.m. and 4 p.m. Freight train at 1 p.m.

Returning to New York, will leave—

Morrisiana and Harlem, 7, 8 20 and 9 a.m., 1, 3, 4 30, 6, 6 28 and 8 p.m.

Fordham, 8 08 and 9 15 a.m., 1 20 and 6 15 p.m.

Williams Bridge, 8 and 9 08 a.m., 1 10, 6 08 p.m.

Tuckahoe, 7 38 and 8 25 a.m., 12 55 and 5 52 p.m.

White Plains, 7 10 and 8 35 a.m., 12 50, 5 35 p.m.

Pleasantville, 8 15 a.m. and 5 15 p.m.

Newcastle, 8 a.m. and 5 p.m.

Mechanicsville, 7 48 a.m. and 4. 48 p.m.

Croton Falls, 7 30 a.m. and 4 30 p.m. Freight train at 10 a.m.

Freight train will leave 32d street for Croton Falls and intermediate places, 4 a.m and City Hall 1 p.m.

Returning, leave Croton Falls 10 a.m. and 9½ p.m.

ON SUNDAYS, the trains will run as follows:

Leave City Hall for Croton Falls, 7 a.m, 4 p.m.

Croton Falls for City Hall, 7 30 a.m., 4 30 p.m.

Leave City Hall for White Plains and intermediate places, 7 and 10 a.m. 4 and 5 30 p.m.

White Plains for City Hall, 7 10 and 8 35 a.m., 12 30 and 5 35 p.m.

Extra trains will be run to Harlem, Fordham and Williams Bridge on Sunday, when the weather is fine.

The trains to and from Croton Falls will not stop on N. York island, except at Broome st. and 32d st.

A car will preceed each train 10 minutes to take up passengers in the city.

Fare from New York to Croton Falls and Somers $1, to Mechanicsville 87½c., to Newcastle 75c., to Pleasantville 62½c. to White Plains 50c. 25tf

BOSTON AND MAINE RAILROAD.

Upper Route, to Portland and the East.

Summer Arrangement.

Commencing July 3d, 1848.

Trains leave Boston as follows, viz:

For Portland at 7 A.M. and 2½ P.M.

For Great Falls at 7 a.m., 2½ and 4½ p.m.

For Haverhill at 7 and 11½ a.m., 2½, 4½ and 6 p.m.

For Lawrence, at 7, 9, 11½ a.m., 2½, 4½, 6, 7 p.m.

For Reading 7, 9 & 11½ a.m., 2½, 4½, 6, 7, 8½ & 10 p.m

Trains leave for Boston as follows, viz:

From Portland at 7½ a.m., and 3 p.m.

From Great Falls at 6½ and 9½ a.m., and 4½ p.m.

From Haverhill at 7, 8½ and 11 a.m., 3½ and 6½ p.m.

Lawrence at 6½, 7½, 8½, 11½ a.m., 12½, 3½, 6½, p.m.

Reading at 6, 6½, 7½, 9½, 11½ a.m., 1, 4, 7½, 9, 10 p.m.

MEDFORD BRANCH TRAINS.

From Boston at 6 50, 9½ a.m., 12½ 2½, 5½, 7, 10 p.m.

From Medford at 6 10, 7½, 10½, a.m., 2, 4, 6½, 9½ p.m.

STEAMBOAT TRAINS.

For BANGOR, every Monday, Wednesday and Friday, at 5 p.m.

For HALLOWELL, every Tuesday, Thursday & Saturday, at 7 a.m.

The Depot in Boston is on Haymarket Square.

CHAS. MINOT, *Sup't.*

Boston, July 3d, 1848.

BOSTON AND PROVIDENCE RAILroad. Summer Arrangement. On and after

Monday, April 3, 1848, the

Trains will run as follows:

Steamboat Train—Leaves Boston daily, except Sunday, at 5 o'clock p.m.

Accommodation Trains—Leave Boston at 7 and 11 a.m. and 4 p.m., and Providence at 7½ and 11 a.m. and 4½ p.m.

Pawtucket Train—Leaves Boston at 4 p.m. and Pawtucket at 7, 10 a.m.

Dedham Trains—Leave Boston at 8 a.m., and 12½ 3½, 6½ and 9 p.m. Leave Dedham at 7 and 9½ a.m. and 2½, 5½ and 8 p.m.

Stoughton Trains—Leave Boston at 11½ a.m. and 5½ p.m. Leave Stoughton at 7, 10 a.m. and 3½ p.m.

WM. RAYMOND LEE, *Sup't.*

BALTIMORE AND SUSQUEHANNA Railroad.—Reduction of Fare. Morning and Afternoon Trains between Baltimore and York.—The Passenger trains run daily, except Sunday, as follows:

Leaves Baltimore at	9 a.m. and	3½ p.m.
Arrives at	9 a.m. and	6½ p.m.
Leaves York at	5 a.m. and	3 p.m.
Arrives at	12½ p.m. and	8 p.m.
Leaves York for Columbia at	1½ p.m. and	8 a.m.
Leaves Columbia for York at	8 a.m. and	2 p.m.

FARE.

Fare to York	$1 50
" Wrightsville	2 00
" Columbia	2 12½

Way points in proportion.

PITTSBURG, GETTYSBURG AND HARRISBURG.

Through tickets to Pittsburg via stage to Harrisburg	$9
Or via Lancaster by railroad	10
Through tickets to Harrisburg or Gettysburg	3

In connection with the afternoon train at 3½ o'clock, a horse car is run to Green Spring and Owing's Mill, arriving at the Mills at 5½ p.m.
Returning, leaves Owing's Mills at 7 a.m.

D. C. H. BORDLEY, *Sup't.*
31 1y Ticket Office, 63 North st.

BALTIMORE AND OHIO RAILROAD. MAIN STEM. The Train carrying the Great Western Mail leaves Baltimore every morning at 7½ and Cumberland at 8 o'clock, passing Ellicott's Mills, Frederick, Harpers Ferry, Martinsburgh and Hancock, connecting daily each way with—the Washington Trains at the Relay House seven miles from Baltimore, with the Winchester Trains at Harpers Ferry—with the various railroad and steamboat lines between Baltimore and Philadelphia and with the lines of Post Coaches between Cumberland and Wheeling and the fine Steamboats on the Monongahela Slack Water between Brownsville and Pitsburgh. Time of arrival at both Cumberland and Baltimore 5½ P. M. Fare between those points $7, and 4 cents per mile for less distances. Fare through to Wheeling $11 and time about 36 hours, to Pittsburgh $10, and time about 32 hours. Through tickets from Philadelphia to Wheeling $13, to Pittsburgh $12. Extra train daily except Sundays from Baltimore to Frederick at 4 P. M., and from Frederick to Baltimore at 8 A. M.

WASHINGTON BRANCH.

Daily trains at 9 A. M. and 5 P. M. and 12 at night from Baltimore and at 6 A. M. and 5½ P. M from Washington, connecting daily with the lines North, South and West, at Baltimore, Washington and the Relay house. Fare $1 60 through between Baltimore and Washington, in either direction, 4 cents per mile for intermediate distances. s13y1

NORWICH AND WORCESTER RAILROAD. Summer Arrangement.—1848.

Accommodation Trains daily, (Sundays excepted.)

Leave Norwich, at 6 a. m., 12 m. and 5 p. m.
Leave Worcester, at 6½ and 10 a. m., and 4½ p. m. connecting with the trains of the Boston and Worcester and Providence and Worcester railroads.

New York & Boston Line. Railroad & Steamers. Leave New York and Boston, daily, Sundays excepted, at 5 p.m.—At New York from pier No. 1 N. River.—At Boston from corner Lincoln and Beach streets, opposite United States Hotel. The steamboat train stops only at Framingham, Worcester, Danielsonville and Norwich.

Freight Trains leave Norwich and Worcester daily, Sundays excepted.—From Worcester at 6½ a. m., from Norwich at 7 a.m.

☞ *Fares are Less when paid for Tickets than when paid in the Cars.* ☜

32 1y S. H. P. LEE, Ja., Sup't.

RAILROAD IRON—2500 TONS HEAVY R R Rail, now landing, and expected shortly to arrive, for sale on most favorable terms by

DAVIS BROOKS & CO.
July 19th, tf 68 Broad street, New York.

PHILADELPHIA AND READING RAILROAD.—Passenger Train Arrangement for

1848.

A Passenger Train will leave Philadelphia and Pottsville daily, except Sundays, at 9 o'clock A. M.

The Train from Philadelphia arrives at Reading at 12 18 M.

The Train from Pottsville arrives at Reading at 10 43 A. M.

Fares.	Miles.	No. 1.	No. 2.
Between Phila. and Pottsville,	92	$3·50 and	$3·00
" " Reading,	58	2·25 and	1·90
" Pottsville "	34	1·40 and	1·20

Five minutes allowed at Reading; and three at other way stations.

Passenger Depot in Philadelphia corner of Broad and Vine streets. 8tf

SOUTH CAROLINA RAILROAD.—A Passenger Train runs daily from Charleston, on the arrival of the boats from Wilmington, N. C., in connection with trains on the Georgia, and Western and Atlantic Railroads—and by stage lines and steamers connects with the Montgomery and West Point, and the Tuscumbia Railroad in N. Alabama.

Fare through from Charleston to Montgomery daily	$26 50
Fare through from Charleston to Huntsville, Decatur and Tuscumbia	22 00

The South Carolina Railroad Co. engage to receive merchandize consigned to their order, and to forward the same to any point on their road; and to the different stations on the Georgia and Western and Atlantic railroad; and to Montgomery, Ala., by the West Point and Montgomery Railroad.

r25 JOHN KING, Jr, *Agent.*

CENTRAL AND MACON AND WESTERN Railroads, Ga.—These Roads with the Western and Atlantic Railroad of the State of Georgia, form a continuous line from Savannah to Oothcaloga, Ga., of 371 miles, viz:

	Miles.
Savannah to Macon—Central Railroad	190
Macon to Atlanta—Macon and Western	101
Atlanta to Oothcaloga—Western and Atlantic	80

Goods will be carried from Savannah to Atlanta and Oothcaloga, at the following rates, viz:

	To Atlanta.	To Oothcaloga.
On Weight Goods—Sugar, Coffee, Liquor, Bagging, Rope, Butter, Cheese, Tobacco, Leather, Hides, Cotton Yarns, Copper, Tin, Bar & Sheet Iron, Hollow Ware & Castings	$0 50	$0 75
Flour, Rice, Bacon in Casks or boxes, Pork, Beef, Fish, Lard, Tallow, Beeswax, Mill Gearing, Pig Iron and Grind Stones	0 50	0 62½
On Measurement Goods—Boxes of Hats, Bonnets and Furniture, per cubic foot	0 20	0 26
Boxes and Bales of Dry Goods, Saddlery, Glass, Paints, Drugs and Confectionary, per cubic foot	0 20	pr. 100 lbs. 35
Crockery, per cubic foot	0 15	" " 35
Molasses and Oil, per hhd., (smaller casks in proportion).	9 00	12 50
Ploughs, (large,) Cultivators, Corn Shellers, and Straw Cutters, each	1 25	1 50
Ploughs, (small,) and Wheelbarrows	0 80	1 05
Salt, per Liverpool Sack	0 70	0 95

Passage—Savannah to Atlanta, $10; Children, under 12 years of age, half price.
Savannah to Macon, $7.

☞ Goods consigned to the subscriber will be forwarded free of Commissions.

☞ Freight may be paid at Savannah, Atlanta or Oothcaloga.

F. WINTER, *Forwarding Agent, C. R. R.*
Savannah, Aug. 15th, 1846. 1y34

NEW YORK ANDERIE RAILROAD LINE. SUMMER ARRANGEMENT. For passengers, twice each way daily, (except Sunday,) leave New York from the foot of Duane St. at 7 o'clock, A. M. and at 4 o'clock, P. M. by steamboat, for Piermont, thence by cars to Ramapo, Monroe, Chester, Goshen, Middletown, Otisville, and the intermediate stations.

The return trains for New York will leave Otisville at 6 30, A. M. and 4 15, P. M.; Middletown at 7 A. M. and 4 40, P. M.; Goshen at 7 22, A. M. and 5 3, P. M.; Chester at 7 36, A. M. and 5 18, P. M.

Fare between New York and Otisville, $1 50; way-fare in proportion.

For Milk—Leave Otisville at 5½ o'clock, morning and evening.

For Freight—The barges "Samuel Marsh and "Henry Suydam, Jr." will leave New York (from the foot of Duane St.) at 5 o'clock, P. M. daily (except Sundays.)

No freight will be received in New York after 5 o'clock, P. M.

Freight for New York will be taken by the trains leaving Otisville at 10½ o'clock, A. M.; Middletown at 11½, A. M.; Goshen at 12½, P. M.; Chester at 1 o'clock, P. M., etc., etc.

For farther particulars, apply to J. F. CLARKSON, Agent, corner of Duane and West Sts., New York, or to S. S. POST, Superintendent Transportation, Piermont.

24tf H. C. SEYMOUR, Sup't.

LITTLE MIAMI RAILROAD COMPANY. Fall and Winter Arrangement, 1847. On and after Monday, September 20th, until further notice, a Passenger train will run as follows:

Leave Cincinnati daily at 9 A. M., for Milford, Foster's Crossing, Deerfield, Morrow, Fort Ancient, Freeport, Waynesville, Spring Valley, Xenia, Yellow Springs, and Springfield. Returning, will leave Springfield at 4½ a.m. Upward train arrives at Springfield at 2½ p.m. Downward train arrives at Cincinnati at 10½ a.m.

Freight trains will run each way daily.

Messrs. Neil, Moore & Co. are running the following stage lines in connection with the road:

A daily line from Xenia to Columbus and Wheeling, carrying the great Eastern mail.

Daily lines from Springfield to Columbus, Zanesville and Wheeling. Also to Urbana and Bellefontaine.

A line of Hacks runs daily in connection with the train between Deerfield and Lebanon.

Passengers leaving for New York and Boston, arrive at Sandusky city via Urbana, Bellefontaine & the Mad River and Lake Erie railroad, in 27 hours, including several hours' sleep at Bellefontaine. To the same point via Columbus, Delaware, Mansfield and the Mansfield and Sandusky city railroad, is 32 hours. Distance from Cincinnati to Springfield by railroad 84 miles.

From Springfield to Bellefontaine by stage, over a good Summer road	32 "
From Bellefontaine to Sandusky city by railroad	102 "

Fare—From Cincinnati to Lebanon	$1 00
" " " Xenia	1 50
" " " Springfield	2 00
" " " Columbus	4 00
" " " Sandusky city	7 00

The Passenger trains runs in connection with Strader & Gorman's line of Mail Packets to Louisville.

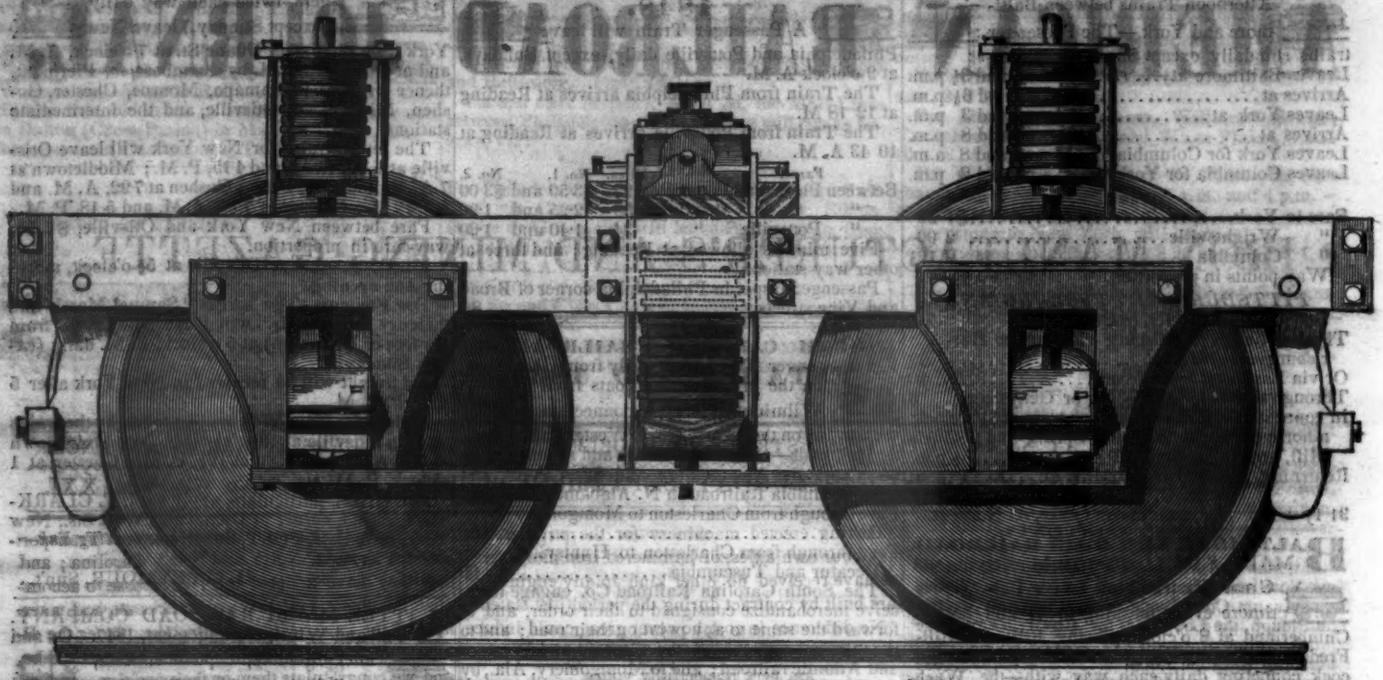
Tickets can be procured at the Broadway Hotel, Dennison House, or at the Depot of the Company on East Front street.

Further information and through tickets for the Stage lines, may be procured at P. Campbell, Agent on Front street, near Broadway.

The company will not be responsible for baggage beyond 50 dollars in value, unless the same is returned to the conductor or agent, and freight paid at of a passage for every $500 in value over that amount.

47tf W. H. CLEMENT, *Sup't.*

VULCANIZED INDIA RUBBER CAR SPRINGS.



THE NEW ENGLAND CAR COMPANY have introduced these Springs, and they are now in operation on every Railroad terminating in Boston, and several others in New England and the Middle States. Their qualities are well understood, or may be readily ascertained by every person interested to know them. They require no recommendation from the Company. The only known compound of India Rubber good for anything for this purpose is the Vulcanized India Rubber, invented by Charles Goodyear, of New Haven, and the application of it, and the form in which it is used, were invented by F. M. Ray, of New York. The right to manufacture and sell the substance itself for the purpose of Railroad Carriage Springs, as well as the form and application of it, are held exclusively by the New England Car Company. No other company, or individual, has any right to sell or use it for such purpose, or has attempted so to use it in this country.

The New England Car Company guarantee the right to use the article they sell for Railroad Carriage Springs only, against all adverse rights, whether under patents or otherwise; and all persons and corporations are cautioned against a similar use of the article, when purchased of any other parties.

The Springs they sell are all manufactured in a uniform manner, and under the immediate inspection of their own Agent, and have been proved and known to answer the purpose. None have been manufactured in this country or imported from abroad beside their own, which would at all answer the purpose; and if any such should be produced, it cannot be used for Car Springs, while Goodyear's patents, and the rights of the New England Car Company under them, remain in force.

The New England Car Company are now prepared to answer orders for all that may be called for, on reasonable notice, and uniform and equitable terms. They invite the most careful examination, and the severest scrutiny, into the merits of their Springs, wherever they have applied them. And if after such examination, your Company should judge it for their interest to adopt them, the N. E. Car Company would respectfully invite the patronage which they think they deserve, and are confident of receiving at your hands.

EDWARD CRANE, *Agent*,
Office 99 State street.

Orders may also be left with F. M. RAY, 100 Broadway, or with WM. RIDER & BROTHERS, No. 58 Liberty street, New York.

The following article, from the pen of Mr HALE, the president of the Boston and Worcester railroad, expresses his opinion of this important improvement, as published in the Boston Daily Advertiser of June 7, 1848. He says:

"Of the numerous uses to which the wonderful elasticity and durability of India Rubber renders this material applicable, we are hardly aware of one in which it has been more successful than in forming springs for railroad cars. We have had occasion to observe, for some months past, its application to this use, on one of the passenger cars on the Newton special train of the Boston and Worcester railroad. It is there used, not only for the springs on which the car rests, but for the springs attached to the draw bar at each end of the car, to prevent any jar on the sudden advancement or interruption of the motion of the car. For both these purposes it appears to be admirably adapted, and we do not learn, that during the period in which it has been used, any defect in it has been discovered. It renders the movements of the car extremely easy, and protects it more effectually, we think, than any other spring which we have ever seen in use, from every harsh or unpleasant motion, either vertical or horizontal. It is simple in its form and application, extremely light, and little liable to get out of repair. During the period of some months, in which we have seen the springs in operation, there is no apparent wear or diminution of their efficiency."

The above statement of Mr. Hale agrees with my own observation in all particulars.

WM. PARKER, Supt. B. & W. R. R.
June 8, 1848.

I fully concur in the foregoing statement, from practical observation of its use for the last 5 months, on the Boston and Worcester railroad corporation cars.

D. N. PICKERING, Jr.,
Supt. Car Building B. & W. R. R.
Boston, June 10, 1848.

The New England Car Company have introduced their Vulcanized India Rubber Car Springs on the roads with which we are respectively connected, and we fully concur with Mr. Hale in the above opinion of their character and properties.

DAVENPORT & BRIDGES, Car Builders.
BRADLEY & RICE, Car Builders.
Boston, June, 1848.

LAP-WELDED WROUGHT IRON TUBES for Tubular Boilers, from 1¼ to 15 inches diameter, and any length not exceeding 17 feet—manufactured by the Caledonian Tube Company, Glasgow, and for sale by

IRVING VAN WART,
12 Platt street, New York.
JOB CUTLER, Patentee.

These Tubes are extensively used by the British Government, and by the principal Engineers and Steam Marine and Railway Companies in the Kingdom. 28tf

AMERICAN RAILROAD JOURNAL.
OFFICE AT THE FRANKLIN HOUSE,
105 Chestnut Street,
PHILADELPHIA, PA.

This is the only periodical having a general circulation throughout the Union, in which all matters connected with public works can be brought to the notice of all persons in any way interested in these undertakings. Hence it offers peculiar advantages for advertising times of departure, rates of fare and freight, improvements in machinery, materials, as iron, timber, stone, cement, etc. It is also the best medium for advertising contracts, and placing the merits of new undertakings fairly before the public.

TERMS.—Five Dollars a year, *in advance*.

RATES OF ADVERTISING.

One page per annum	$125 00
One column "	50 00
One square "	15 00
One page per month	20 00
One column "	8 00
One square "	2 50
One page, single insertion	8 00
One columnn " "	3 00
One square " "	1 00
Professional notices per annum	5

☞ LETTERS and COMMUNICATIONS for this Journal may be directed to the *Editor*,

D. K. MINOR.